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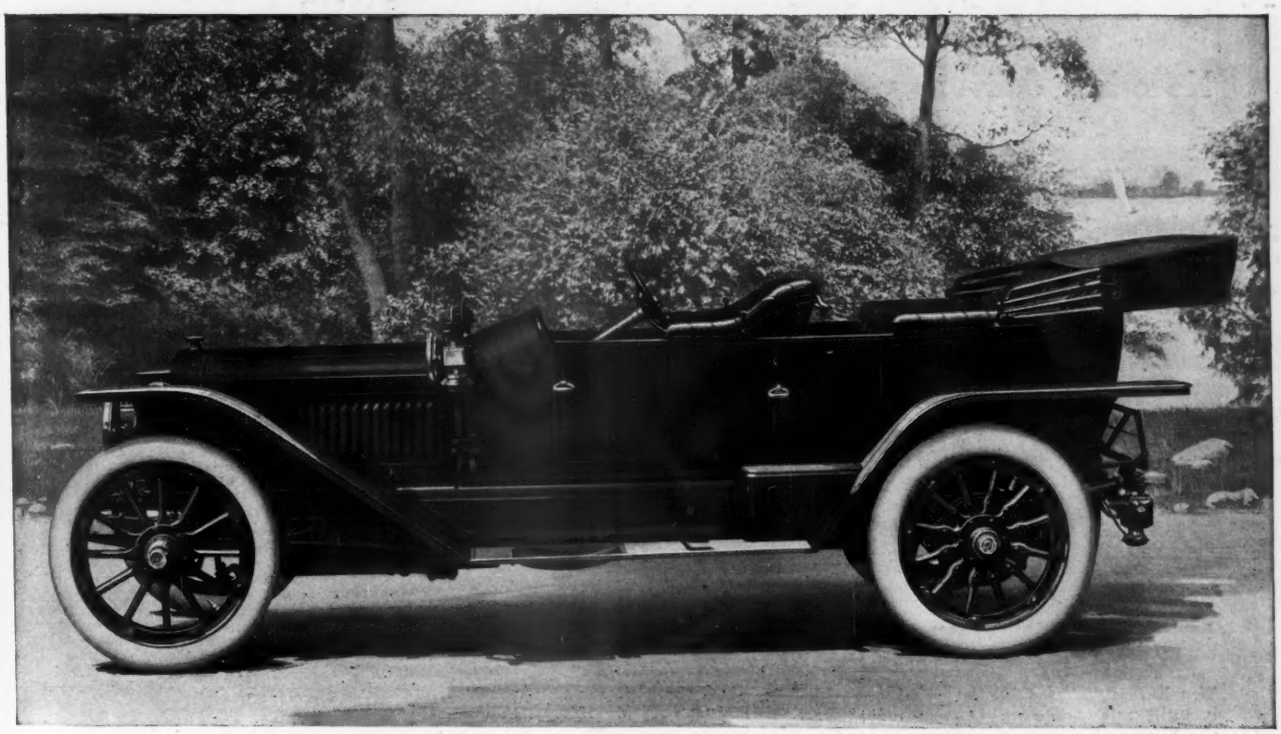
MOTOR AGE

VOLUME XXI CHICAGO, MAY 16, 1912 NUMBER 20



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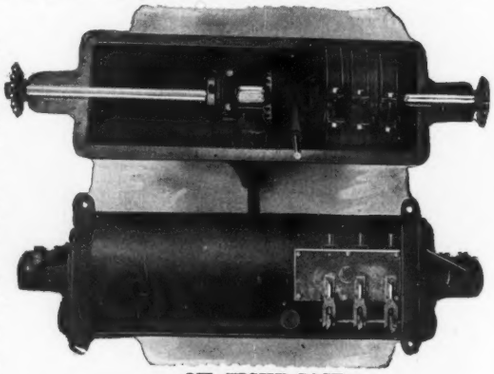

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MOTOR AGE

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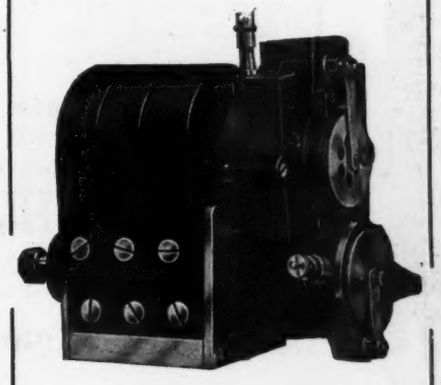

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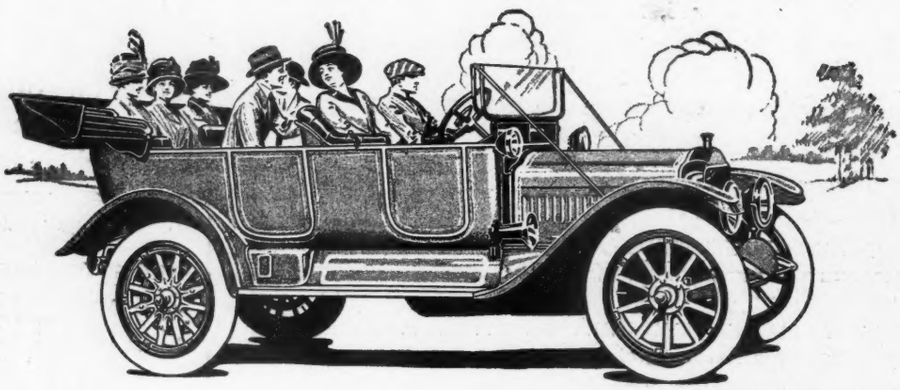

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VOL. XXI, No. 20 CHICAGO, MAY 16, 1912 $3.00 PER YEAR

MOTOR AGE

Indian Trails Now Motoring Roads

SECTION OF ROAD IN KAY COUNTY, OKLAHOMA, ON PROPOSED INTERSTATE HIGHWAY BUILT UNDER DIRECTION OF STATE HIGHWAY DEPARTMENT

Oklahoma, Handicapped by Legislative Slip, Striving to Secure Modern Highways—Story of the Campaign

By W. F. Kerr

OKLAHOMA is a checkerboard of historic trails. Back of each is a sentiment existing particularly among the pioneers along its route that it is the best and most feasible route for a modern road. Colonel Sidney Suggs, state commissioner of highways, has had his engineer go over some of these routes and he finds them practicable. So it is possible that a large share of the energy and money that is to be expended in road building in Oklahoma during the next 2 or 3 years will go toward reviving and reinstating some of the old trails. This fact is established by the determination of the commissioner to devote himself in a large measure to the building of state highways. Details naturally will involve these highways in piecemeal, for each county is to get its pro rata of attention from the state department.

A route most easily traced, 40 years after it was blazed, is known as the Chisholm trail, a north-south highway over which pioneer cattlemen drove their herds from Texas to Kansas, Colorado, Nebraska, the Dakotas and to Montana and Wyoming. When Commissioner Suggs suggested the reestablishment of this route about a year ago, it met with instant

BRIDGE OVER SOUTH CANADIAN RIVER, NEAR PURCELL, OKLA. RECENTLY CONSTRUCTED AT A COST OF $100,000, DEDICATED BY ST... THROUGH OKLAHOMA. WHEN THE GLIDDEN TOURISTS CROSSED THIS RIVER IN 1910 IT WAS NECESSARY TO DRIVE FOR SEVE... HIGH... MILES

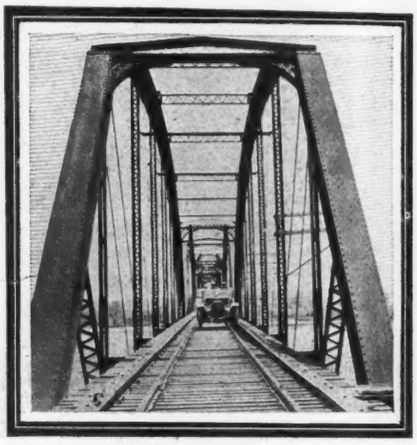
approval in all the counties of Oklahoma through which the route was to be traced. In a few months its course was almost definitely determined and plans were under way for rehabilitating it. The movement began in Grady county, being backed by the commercial club at Chickasha and other similar organizations in the county. A few weeks later a long section of the road had been established in the county, by public-spirited citizens.

Grant County's Work

The movement next found supporters in Grant county. Here several mayors proclaimed the day set apart for road working a holiday and the board of county commissioners and officers of commercial clubs called upon the people generally to assist in the work. Results similar to those obtained in Grady county were obtained in Grant county. Many miles of grade were established, a few bridges were built and other fundamentals of road building were attended to. It was a holiday practically all over the country and hundreds of farmers left their fields with their plows and scrapers and teams and donated them to the road building project.

The state commissioner's engineer has practically completed a map of the Chisholm trail route and probably the first state highway to be completed in Oklahoma will be this. It traverses a section of the country of topography excellent for road construction. There are few streams that it will be expensive to bridge, few hills and no mountains and the country for the most part consists of even timber land and rolling prairies.

The Santa Fe trail, perhaps the most historic in the state, also is to be reestablished, although little has been done yet toward this project, for the principal reason that its course is irregular and does not lie in a direction approaching due north and south or east and west. In fact it has a diagonal route. This trail, if historic country were considered of much importance, could profitably be taken up by those promoting the Ocean-to-Ocean highway, since it would bring travelers in touch with many scenes and places of historic interest, such as Fort Supply, where General Custer was stationed; Fort Sill, a pioneer Indian post, the site for which was chosen by General Scott and



GLIDDENITES USING RAILROAD BRIDGE OVER SOUTH CANADIAN RIVER

General Sheridan, and it would traverse an area formerly occupied by no fewer than fifteen tribes of Indians.

The Fort Towson Trail

A feasible road project for eastern Oklahoma is the Fort Towson trail, a pioneer route established more than 70 years ago through probably the wildest of the large regions set apart for the five civilized tribes. It extended from Fort Smith, Ark., through the timber region of the Choctaw nation to points in Texas ... Louisiana. It passed near Fort T... ...e of the first military posts established on the frontier when the Indians were moved to the new reservation. The trail and the fort were named after General Nathaniel Towson of Maryland, an army officer who was prominent during the first quarter of the last century. The commissioner has not yet begun plans for reestablishing this highway as it is less useful than some others in the state, for it passes through a timber reservation of 2,000,000 acres in the southeastern part of the Choctaw nation and no provision for its sale is likely within the next few years.

The Fort Towson trail probably would be most expensive to reestablish since it traverses an area of mountainous country and several swift-running streams intersect its course, yet no more satisfactory a route for motorists, historic associations and scenery considered, could be established in the state.

Of still more historic interest is the

CLAY PIT IN OKLAHOMA WHICH FURNISHES ROAD MATERIAL

HIGHWAY COMMISSIONER SUGGS AS THE FIRST PIECE OF PERMANENT HIGHWAY CONSTRUCTION ON THE INTERSTATE HIGHWAY MILES ON RAILROAD TIES. THE GLIDDENITES TRAVELED THROUGH SAND AT APPROACHES OVER GRASS SPREAD BY OKLAHOMANS

THATCHED HOUSE OF WICHITA INDIANS WHO SCORN THE TEPEE

Irving trail, or the route traveled by Washington Irving from Fort Gibson, Indian territory, to his camping place on the Arkansas river in the southern part of the former Osage nation. This route is to be reestablished, if possible, by the state organization of boy scouts.

Made Famous by Irving

A greater part of the route lies near the Arkansas river, for Irving was told by the military men at Fort Gibson that the river would lead him to the great prairies and the then established frontier. This is a scenic route, but, like the Santa Fe trail, it runs diagonal to the plans of the state department that contemplate in early road building lines running as nearly due north and south and east and west as possible. The Irving trail passes through the great oil and gas fields of Oklahoma, past thousands of derricks and tank farms and flowing wells and factories and smelters. Motorists of the middle west probably would be interested in knowing that citizens of the old Osage nation are planning for a monster celebration this summer on the site where Washington Irving camped while he was making his tour of the prairies. The Daughters of the American Revolution of Oklahoma and the State Federation of Women's Clubs will assist in this celebration. Probably the boy scouts will have completed their journey over the Irving trail by the time the celebration is held.

But there are other highway projects in the state receiving more attention than the old trail projects at this time. For instance, one of the greatest ambitions of Commissioner Suggs is to build the Oklahoma section of the Interstate Postal highway which bisects Oklahoma north and south, and passes through Newkirk, Perry, Guthrie, Oklahoma City, Norman, Purcell, Paul's Valley and Ardmore, some of the leading cities of the central part of the state. Recently citizens of Purcell built a wagon and motor bridge over the South Canadian river at a cost of $100,000 which is said to be the largest bridge of its kind in the United States. Plans are being made for bridging this stream near Norman. Both bridges will be on the Postal highway. Other bridges are planned along the route and when they are built the principal engineering feats of the project in Oklahoma will have been accomplished.

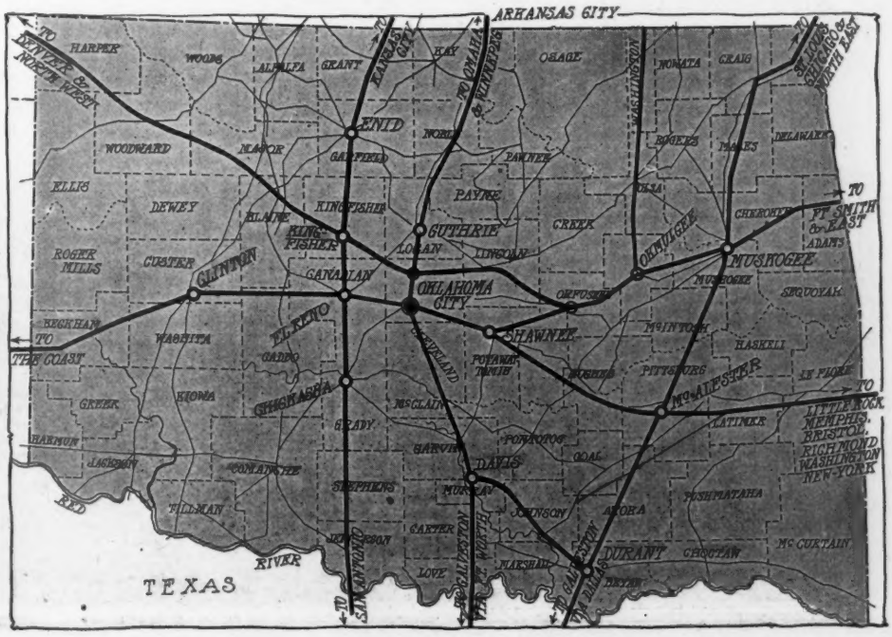
Another north and south highway project is under way in the eastern part of the state. The route traverses the oil and gas and coal fields and the Cherokee, Choctaw and Chickasaw nations.

The last legislature passed a bill, which became a law but which is being contested, providing that certain townships or districts may organize into a road district and vote bonds for road purposes. If this law is held valid under the constitution, it means that hundreds of thousands of dollars will be spent in practically all of the seventy-six counties of Oklahoma within the next 2 years.

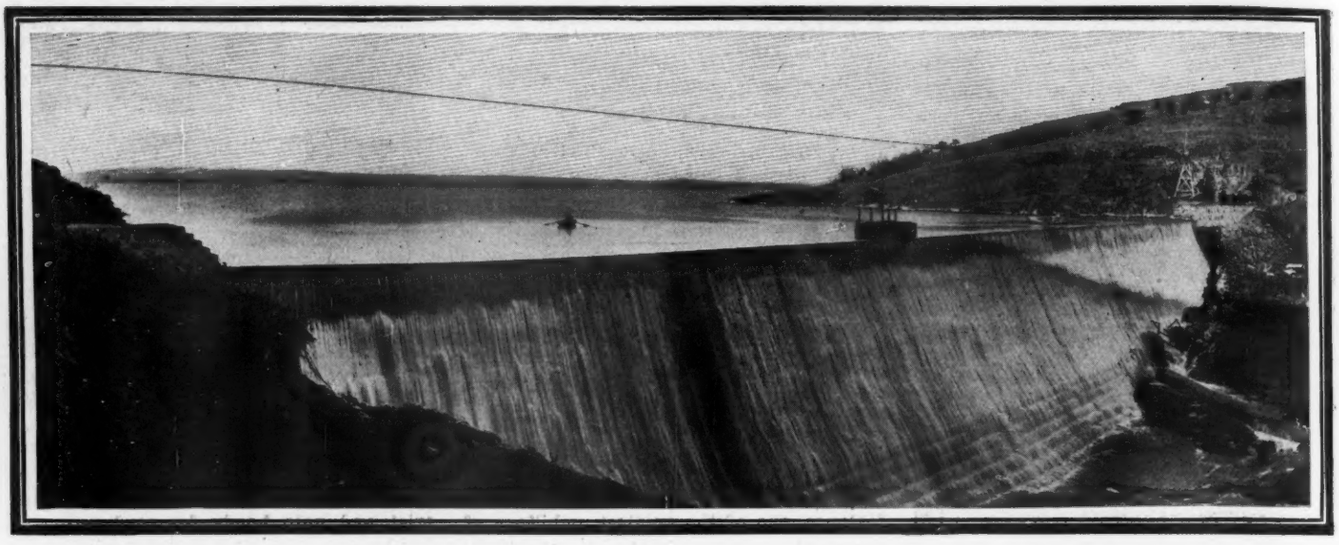
History of the Bill

The history back of this bill is an interesting one and shows what one man can do if he only possesses the necessary fighting spirit. Colonel Sidney Suggs is the man who made possible such a law, but it was only after he had appeared before three different legislatures that he got it through. By persistently hammering away at the solons he secured the enactment of the measure, but after it had emerged from the legal mill it was found that the legislature had neglected to appropriate money necessary to the maintenance of the highway commission—about the same state of affairs as prevails in Illinois, where the road fund, secured from registrations of motor cars, is tied up by the failure of the legislature to appropriate.

Colonel Suggs, however, was not to be



MAP SHOWING CROSS-STATE ROUTES UPON WHICH OKLAHOMA IS WORKING



LAKE AND DAM IN WICHITA MOUNTAINS, NEAR PROPOSED SCENIC PUBLIC HIGHWAY. LAKE IS NEAR FORT SILL AND FURNISHES WATER TO CITY OF LAWTON

daunted. He appealed to the governor to appoint the commission anyway and said he would look after the financial details, taking a chance on having the next legislature pay him back. So the commission was appointed and Colonel Suggs himself naturally was appointed at the head of it. The work of this commission has been so good that that colonel now has an army of friends throughout the state and he is so powerful in consequence of his good roads work that it is thought that the next legislature hardly can refuse him anything he may want that will have a bearing on highway improvement.

Legal Entanglements Exist

Because of the present existing legal entanglements, Oklahoma has to secure its road funds through donations, which perhaps explains why only 70 miles of improved roads exist at the present time. But when matters are straightened out, it is thought everything will be different and that there will be plenty of money available for road improvement. The donations have been used mainly to get the roads in shape for the top dressing or metaling, which will be attended to when the treasury of the commission has more in it than it has at present.

The law that has been passed provides for road improvements by districts, which are established by petition and which cannot be less than 18 square miles. When such a district is established, an engineer makes a preliminary survey and estimates the cost of road building, after which the people themselves vote to legalize the issuing of 25-year bonds to any amount necessary not to exceed 5 per cent of the assessed valuation of the district and which also provides for the establishment of a 4 per cent sinking fund. This legal procedure already has been gone through with in several counties and right now there are three in which big sums are tied up by the suits. Lincoln county has $600,000 available for road purposes, Grady county $300,000 and Grant county $200,000.

Many Miles of Roads

Oklahomans have a rare field in which to work, for of the 115,000 miles of roads within its boundaries, there are only some 70 miles which have been improved. This may sound infinitesimally small, but then it must be remembered that Oklahoma is just getting its start as a good roads state and then when it once strikes its stride this mileage will grow in leaps and bounds. Plans that have been made already call for the improvement of 300 miles of roads and this triple century will include all the main routes, trunk lines that will encourage touring and form the connecting links in transcontinental trails as well as those road thoroughfares that run from north to south.

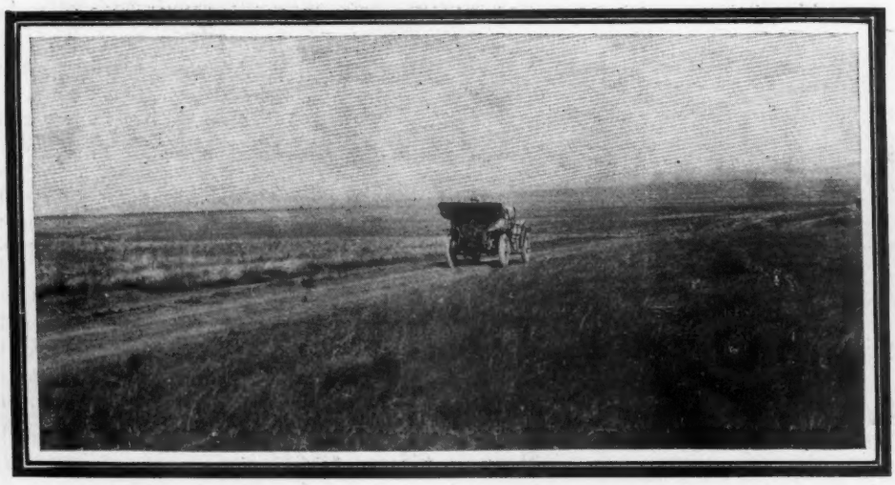
For this 300 miles the roads will be made of sand and clay, of bituminous asphalt and of gravel. Oklahoma is fortunate indeed in having plenty of material with which to work, for in this state are some of the largest beds of rock asphalt in the world, at Ardmore, while clay also is abundant. Therefore, material may be had very cheaply, as is shown by the fact that the sand-clay roads may be built at a cost ranging from $1,200 to $2,000 a mile, while the bituminous asphalt roads can be put down at a rate of $500 a foot in width per mile, which brings the average cost of a 16-foot road to about $8,000 a mile.

The commonness of asphalt has resulted in the construction of many miles of this kind of road. When the Glidden tourists went into Lawton in 1910 they were surprised to not only find the city streets asphalt, but also to enter Lawton over the same kind of road. In fact, asphalt streets were as common as they are in Chicago or New York.

Sand-Clay Roads

Most of the sand-clay roads will of course be built in what formerly was Indian territory, for the asphalt beds are in the other part of the state. The sand-clay road, however, makes a fine thoroughfare and is made up of four alternating layers of sand and clay. First there is a foundation of sand, then a layer of clay, then sand and a top dressing of clay.

Few know it, but Oklahoma is the only



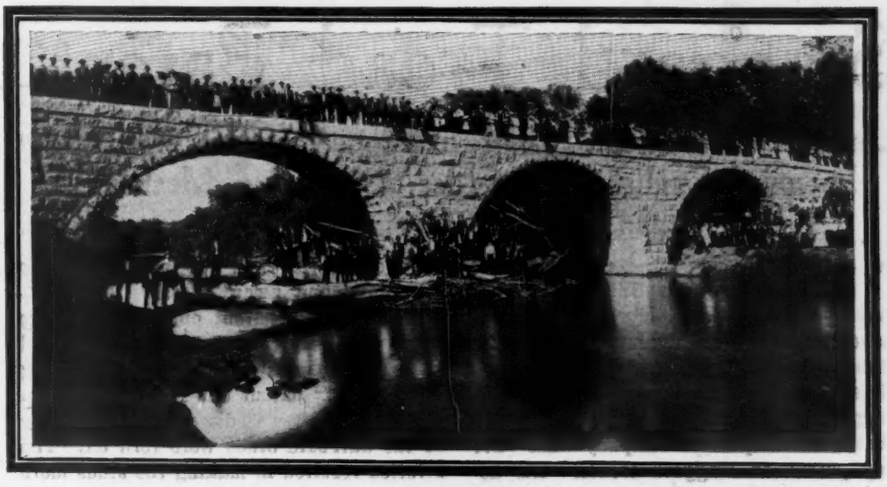
STRETCH OF PRAIRIE ROAD NEAR FORT SILL

state in the union having a constitutional provision for a state highway commission; that is, its charter made it obligatory on the part of the legislature to create that body, whereas in other states it is optional with the legislatures whether or not such a commission shall be legalized. Also there is a difference in the width of road easement in the original Oklahoma territory and Indian territory. In the former the easement is 66 feet. That does not mean the width of the road bed itself, but the land that is set aside for roads themselves—from fence to fence, one might say in states where fences are common. In old Indian territory, however, this easement only is 33 feet. Now that Indian territory is part of Oklahoma itself, it is found that it is impossible to change the easement width; that where original Oklahoma gets its 66 feet because the government was wise enough to provide for this width, in old Indian territory it is necessary to buy the extra land if a wider easement than 33 feet is desired.

The spirit of road improvement pervades the state. Probably no other state has more interest in road building than Oklahoma at this time. One day the citizens of Chandler en masse turned out and built several miles of a public highway. Bankers, merchants, lawyers and doctors put on overalls and wielded picks and shovels and spades, and many farmers lent their teams and implements. A similar proceeding was had at Lawton, in southwestern Oklahoma, and at Nowata plans are made for probably the largest road-building project by donation contemplated in this or any other state.

Everyone Helping

A new impetus has been given road building in Oklahoma by the several county agents of the farm demonstration work being carried on under the United States department of agriculture. The agents are disseminating good roads literature and discussing plans with all the farmers in their jurisdiction. This work is being pushed by A. L. Kennedy of Ada, agent for Pontotoc county, who apparently is leading the movement of the agents started in the state.



TYPE OF BRIDGE BEING CONSTRUCTED IN OSAGE COUNTY

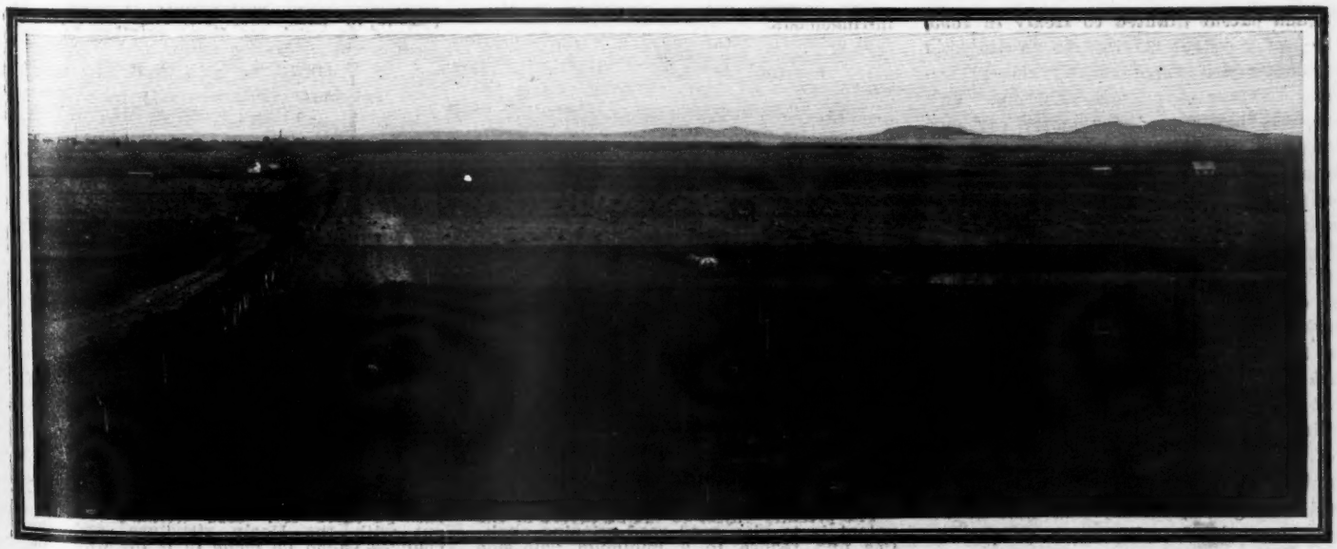
FRANCE REVAMPING ROAD SCHEME

Paris, May 3—The sum of $60,000,000 is considered necessary in order to put the entire road system of France in a condition fit to withstand intense modern traffic. In design the roads are the finest in the world, but as the result of the increasing national and international traffic of the last 10 years the surfaces of the main highways have been ruined, and in order to place them in a permanently satisfactory condition they must be remade to their foundations.

Where the traffic is most intense, the old surface must be removed entirely, a solid cement foundation laid, and this surfaced with smooth, closely-set granite blocks without any camber. Such a road is practically indestructible and is ideal for fast motor traffic. In other cases the roads must be given a more solid foundation, remade with better material and rendered waterproof by the use of tar. It is for work such as this—and not at all for straightening or enlarging—that the sum of $60,000,000 is considered necessary. If this work is undertaken the roads of France will be not only the straightest and the widest but the best surfaced in the world. It is estimated that 6 years will be necessary to carry the scheme to completion.

With the roads put in a permanently satisfactory condition, it is estimated that $10,000,000 should be expended annually on their maintenance, instead of the $4,000,000 at present allotted for this purpose. A scheme is on foot to obtain from parliament the special grant of $60,000,000 and an increase of the annual allowance to $10,000,000.

One of the most powerful arguments of the motorists is that they, in conjunction with cyclists and motor cyclists, now pay in direct and indirect car taxation, duties on oil and gasoline, etc., an annual sum of not less than $10,000,000, and that the allowance for road maintenance is no greater than it was 10 years ago when the government revenue from motorists was practically nil.



OKLAHOMA ROAD AND ALFALFA FIELD NEAR HOBART, WITH WICHITA MOUNTAINS IN BACKGROUND

Staggard Tread Patent Held Invalid

United States Circuit Court of Appeals Rules Mell Only Improved English Healy Idea, Displaying Mechanical Rather than Inventive Genius—Full Decision

NEW YORK, May 15—By a decision of Judge Noyes in the United States circuit court of appeals, Morgan & Wright have won their case against the Republic Rubber Co., in the matter of nobby tread tires not being an infringement of the staggard tread. Judge Noyes decides that the Republic company has not any patent on staggard treads. His decision means that letters patent No. 898,907, issued Tod H. Mell on September 15, 1908, is invalid. This is a patent that the Republic company started suit in 1909 against Morgan & Wright for infringement of, when the latter company marketed its nobby tread and anti-skid tire. It will be remembered that in Motor Age, January 4, 1912, Judge Hazel in the United States circuit court handed down a decision in which he sustained the Mell patent and ruled that the nobby tread was an infringement. Immediately this ruling was handed down it was appealed by Morgan & Wright and the present decision is the result of the appeal.

Undoubtedly this does not end the case, as the Republic company has two possible steps which it may take. It can have the case heard in another circuit court of appeals, and after this the matter can go to the supreme court, the same as in the Grant patent case. As yet the Republic company has not formulated or announced its plans.

By Judge Noyes' decision it means that Tod H. Mell had no right to letters patent No. 898,907, which was granted him in 1908. Judge Noyes holds that he had no right to such a patent because the constructions on an anti-skid tire referred to in this patent were anticipated by an English patent granted to Healy in 1895. The Healy patent referred to an anti-skid pneumatic tire which had circular projections or studs to prevent skidding. This tire was never used for motor car purposes, its use being restricted entirely to motor cycles. In a word, Judge Noyes' decision holds that, while Tod. H. Mell made several improvements on the form of stud used on the Healy tire, yet the work did not constitute inventive faculty; rather he holds that the improvements worked by Mell in the Healy tire called for the exercise of mere mechanical skill, such mechanical skill as is expected, and that it involved only the exercise of the ordinary faculties and reasonings upon the material supplied, and the faculty of manipulation which results from habitual and intelligent practice, and that in no sense was the creative work of the inventive faculty, which it is the purpose of the constitution and the patent laws to encourage and award, used.

In the Healy patent oblong studs were used. The court's decision finds that Tod H. Mell had a tire constructed according to the Healy patent and that after a run of 200 miles it was discovered that many of the anti-skid studs were torn off. The solution resulted in making the studs more blunt and wider at the base and setting them closer together. In order to prevent them tearing away, fillets were used where the stud unites with the tread part proper. After citing the process of experimentation, which Tod H. Mell is supposed to have gone through in his development of the present staggard tread from the Healy type, the court holds that ordinary mechanical skill was used and not inventive faculty.

SPLITDORF MERGER PROBABLE

New York, May 15—Recent rumors of a projected merger of C. F. Splitdorf, Inc., with the Alvord group of industries seem to have been founded on fact, although its consummation has been delayed by premature reports of the negotiations. The deal, involving about $3,500,000, has not been closed as yet, but Sidney S. Meyers, an attorney acting in a way for both parties, admitted that there was an element of truth in the reports.

Although no official confirmation of the details could be obtained, the interests mentioned in the reports include the big ignition and accessory factory of C. F. Splitdorf, Inc., in New York; the Standard, Excelsior Needle and Torrington companies, located at Torrington, Conn., and the Eagle company, of Newark, N. J. The Alvord concerns have been in the manufacture of spark plugs. The amalgamated company, according to the reports, will have John Alvord as president and Charles F. Splitdorf as vice-president.

STUDEBAKER DECLARES DIVIDEND

Detroit, Mich., May 11—The Studebaker Corporation last Wednesday authorized the 1¾ per cent dividend on the $18,000,000 capital stock of the concern, payable June 1. It is stated that at the present time Studebaker stock is being boosted both in New York and Detroit and there is a lively demand for common. The entire bond issue of $8,000,000, authorized last February, has been disposed of, it is said, and it now is off the general market.

Decision in Full as Handed Down in Case of Morgan &

THE patent in suit is for an improvement in resilient vehicle tires and consists, speaking broadly, in an arrangement of protecting studs around the tread surface of the tire, having for its primary object the obtaining of superior road gripping qualities and the preventing of the vehicle from side-slipping or skidding.

The first claim of the patent—which was sustained by the lower court—reads as follows:

"A tire for vehicle wheels provided with outwardly projecting circumferentially arranged elongated studs, each having inwardly diverging walls, a flat outer surface and a relatively large base, substantially as described."

The defenses are: 1—Invalidity; 2—Non-infringement.

In considering the question of the validity of the patent we should look, in the first place, for the disclosure in the prior art which seems to approach most closely the claimed invention, and our attention is at once attracted to the English patent granted to Healy in 1895.

Taking up then the Healy patent, we may conveniently test the question of anticipation with reference to the rule that that which infringes if later, anticipates if earlier. Let us then assume that the Healy patent is of later date than the patent in suit and see whether it infringes.

The patent in suit is for an improved outer surface of a vehicle tire and it is not limited in scope to any class of vehicles, although a motor car is indicated as an example of an appropriate use. The Healy patent also is for an improved outer surface of a tire and likewise is not limited to any class of vehicles, although cycles are mentioned particularly.

The structure of the patent in suit is designed especially for use in connection with pneumatic tires, but may be used with other tires. The Healy patent is confined to pneumatic tires. This distinction is not of importance, however, as all the tires in question in this case are pneumatic tires.

The primary object of the structure of the patent is to give good road-gripping qualities and reduce to a minimum "all side 'skidding' tendencies." The purpose of the Healy structure is to give a better "bite" and prevent side-slipping.

The patentee seeks to accomplish his object by providing the tread surface of the tire with a circumferential arrangement of elongated outwardly projecting studs arranged so as to break joints. Healy seeks to obtain the same object by a similar arrangement of elongated outwardly projecting studs.

From the examination thus far made it is apparent that the present patentee and the Healy seek to accomplish the same object and to accomplish it, so far as now disclosed, in substantially the same way. The Healy patent would clearly infringe unless there are some minor differences in construction which differentiate it from the patent in suit. And the only differences claimed to exist are those relating to the form of the projecting studs.

It is pointed out that the studs of the claim in issue have inwardly diverging walls with flat outer surfaces, while the Healy studs are described as being semi-circular in cross section.

It is also pointed out that the studs of the claim have a relatively large base, and if we assume that this requirement means something more than the requirement of inwardly diverging walls and implies a fillet at the bases of the studs, the presence of such fillets constitutes another difference in form.

The patents accomplishing the same object in so nearly the same way, we regard it as very doubtful whether the Healy structure would avoid infringement by the mere differences in the form of the studs if it were later, and being earlier, we have the same doubt whether it does not anticipate. Possibly, however, precise anticipation does not appear, and we deem it desirable to proceed further with the examination and determine whether, with the Healy patent alone or with other patents in the prior art, invention is to be found in the patent in suit.

We might consider this question altogether in the abstract. But we can do better than that in this case. The record shows the patentee—Mr. Mell—actually starting out with the Healy structure, and the changes which he made in it for which he obtained the present patent. The case is

Goodrich Buys the Diamond Company

Huge Deal Put Through at Akron Which Results in Transfer of Interests for $15,000,000 Worth of 7 per cent Preferred and $30,000,000 Common Stock

AKRON, O., May 15—Special telegram —The B. F. Goodrich Co. has purchased outright the Diamond Rubber Co of this city, paying for the property the huge sum of $15,000,000 in 7 per cent cumulative preferred stock and $30,000,000 in common stock. This deal was perfected last Saturday by officers of the two companies and of course is subject to ratification by the stockholders of the two concerns.

Great secrecy was maintained and up until this afternoon outsiders, who had heard the rumor, believed it was a merger. At a late hour this afternoon, though,H. E. Raymond, vice-president of the Goodrich company, gave it out that it was a purchase and not a merger and soon after the following official statement was made by B. G. Work, president of the Goodrich company:

"Goldman, Sachs & Co. announce for themselves and Lehman Brothers, New York, and Kleinwort, Sons & Co., London, that arrangements have been completed for the purchase by the B. F. Goodrich Co., New York, and the transfer to it of the property and business of the Diamond Rubber Co.

"The companies, as is well known, occupy adjoining premises in the city of Akron, O., and are two of the half-dozen largest and most successful concerns of the kind in the United States, each manufacturing a great variety of rubber goods including motor car tires. The consideration to be paid by the Goodrich company is to consist of $15,000,000 of the 7 per cent cumulative preferred stock and $30,000,000 of the common stock of the B. F. Goodrich Co.

"For the purpose of enabling it to carry out the transaction, the B. F. Goodrich Co. will immediately call a meeting of its stockholders for the purpose of authorizing an increase of its capital stock by the issuance of an additional $15,000,000 of preferred stock and an additional $30,000,000 of common stock. When this increase of stock shall have been effected the capital of the B. F. Goodrich Co. will consist of $30,000,000 of 7 per cent cumulative preferred stock and $60,000,000 of common stock.

"Goldman, Sachs & Co., and Lehman Brothers, of New York, and Kleinwort, Sons & Co., of London, have agreed to purchase from the Diamond Rubber Co. a large block of the stock of the B. F. Goodrich Co., which, together with a previous purchase of stock made at the time of the organization of the present B. F. Goodrich Co., will comprise about one-half of the entire issue of the preferred stock of the latter company and a considerable amount of the common stock as well.

"It is expected that in consequence of the acquisition of this interest by the banking houses named and the distribution of a portion of their stock among their clients a very much broader market for the securities of the B. F. Goodrich Co. will exist in the future than has ever existed for the securities either of the old B. F. Goodrich Co. or of the Diamond Rubber Co. Stockholders of the Diamond Rubber Co., upon the distribution of its assets, will receive a considerable amount of cash in addition to their several shares in the stock of the B. F. Goodrich Co. preferred and common. The Goodrich company will retain the executive staff of the Diamond Rubber Co. in addition to its present staff and it is not expected that any radical change in organization or operating conditions will occur.

"Following are the proposed directors of the new company: F. A. Hardy, Chicago, chairman of the board; F. A. Mason, Akron, vice-chairman; B. G. Work, president; A. H. Marks, vice-president and general manager; E. C. Shaw, second vice-president and works manager; H. E. Raymond, second vice-president and sales manager; W. B. Miller, second vice-president and assistant sales manager; C. B. Raymond, secretary; W. K. Means, treasurer. A. H. Noah refused an offer for treasurer and will retire from business. He will, however, remain a member of the board of directors for the balance of the year. O. C. Barber and C. C. Goodrich are new members of the board."

B. G. Work, who is to be president of the new company and who furnished the above statement, added: "We want it thoroughly understood that we do not contemplate buying other companies as rumored." Matters will stand as they are to the stockholders' meetings.

REVERE SUFFERS BIG FIRE LOSS

Providence, R. I., May 13—The storehouse of the Revere Rubber Co., of this city, was totally destroyed by a fire on May 7, causing a loss of $600,000. Stored in the building were 20,000 tires, valued at more than $300,000, which were a total loss. The loss to the Revere Rubber Co. is estimated at $550,000 and is partially covered by insurance. The cause of the fire is unknown.

Wright Vs. Republic in Staggard-Nobby Tread Suit

rather remarkable in that we can see the patentee making changes in the nearest structure of the prior art and can determine better than ordinarily whether such changes involved the exercise of the inventive faculties or mere mechanical skill.

It appears from the testimony that the attention of Mr. Mell—a motor car tire maker —was called to the Healy patent and that he had a tire with a stud arrangement constructed in accordance with that patent for use on a motor car and ran it for some 200 miles. After this experimental run, the patentee talked about the condition of the tire with his associate Petersen. Petersen called Mell's attention to the fact that many of the studs were gone and that others were badly undercut, and Mell said that he could easily remove the objection of undercutting by putting a fillet around the stud and taper it off from the tread. He also suggested that the Healy stud was too pointed; that they were a little too narrow and light, and that more studs should be put on the tread. Thereupon, as Petersen says, "Mr. Mell and I talked it over in the house and we decided to make the studs more blunt and wider and set them close together, and then Mr. Mell went ahead and got up the drawings and moulds made and we made some tires of that kind. That was the staggard tread tire—staggard being the name of the tire made under the patent in suit."

It is thus quite apparent that the difficulties which appeared in the Healy structure were easy of solution. No experiments were necessary. The remedy seems to have been quite obvious. We think it the better view that any head workman in the tire art should have been able to make the studs larger and flatter and to provide a filleted base to prevent them from being torn off. The case is one in which the language of Mr. Justice Matthews in Hollister vs. Benedict, 113 U. S. 59, 7 3,seems applicable:

"A skilled mechanic, witnessing the performance of a machine, inadequate by reason of some defect, to accomplish the object for which it had been designed, by the application of his common knowledge and experience perceives the reason of the failure, and supplies what is obviously wanting. It is but the display of the expected skill of the calling, and involves only the exercise of the ordinary faculties of reasoning upon the materials supplied by a special knowledge, and the faculty of manipulation which results from its habitual and intelligent practice; and is in no sense the creative work of that inventive faculty which it is the purpose of the constitution and the patent laws to encourage and reward."

But we do not find it necessary to hold that on account of the presence of the Healy patent alone in the prior art, the patent in suit is invalid for want of invention. The Healy patent includes all vehicle tires and would embrace those of automobiles. The patent in suit embraces all tires and would include those of cycles. Assuming, however, that the Healy patent is to be regarded as relating to cycles and the present patent to automobiles and that automobiles require more of tires than cycles, still there were many patents and uses in the prior art showing automobile tires with studs upon their tread surface to prevent skidding and to accomplish the objects stated in the patent. Thus, for example, the Clark British patent of 1904 shows a cover for pneumatic tires for motor vehicles with studs to prevent skidding or side slipping, and some of the illustrations of this patent show an arrangement of projections quite similar to those of the patent in suit. So the Heinemann British patent of 1907 shows various arrangements of studs upon the tread surface of motor vehicle tires. The record also shows many uses in the prior art of nonskid automobile tires with projecting studs variously arranged.

Therefore, in determining whether invention is to be found in making the changes in the Healy tire—regarded as a bicycle tire —to obtain the tire of the patent in suit—regarded as an automobile tire—we must consider the motor car tires shown in the prior art. And, considering the art as it is shown to have existed, we are unable to reach any other conclusion than that the tire of the patent in suit, although successful, CAME INTO EXISTENCE THROUGH THE EXERCISE OF MERE MECHANICAL SKILL AND NOT OF THE INVENTIVE FACULTIES.

The decree of the district court is reversed with costs and the cause is remanded with instructions to dismiss the bill with costs.

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Avoiding Motoring Accidents

THE spring and summer accident list has started and is growing rapidly. Mayor Harrison of Chicago looks upon the daily fatalities in the Windy City as being almost as great as in the days of the grade railroad crossings within the city limits. He cites that to eliminate railroad accidents in those days it was necessary to elevate the steam railroad lines entering the city. His inferences suggest the establishment of recognized motor routes in the city, because of the fact that many of the accidents are not on the boulevards, where motor traffic is many times as great as on the regular city streets, but on less traveled streets and not at hours of greatest traffic. The Chicago boulevards are pleasure thoroughfares, as freight traffic is forbidden on them. Due to this prohibition the majority of the boulevard traffic is motor and the recognized rules of the road are strictly obeyed. Not only is there obedience of the drivers, but there is a more strict obedience of the pedestrians to traffic regulations.

THERE are several methods of eliminating accidents on thoroughfares where mixed traffic, including street car lines, is permitted. These are the great scenes of accidents. A motor car on such a street is one minute passing a horse-drawn truck, the next it is overtaking a motor truck, then at the next second it may be side by side with a trolley car, with the net result that the dangers of accidents are manifold greater than on a boulevard where the motor may be traveling 50 per cent faster and where the number of vehicles on the street is double. The solution of accidents on a street with mixed traffic is that slow-moving vehicles be compelled to keep close to the curb. In many cities this rule is not obeyed. The police do not enforce it except perhaps in some of the heavily congested centers, and its enforcement in these is not with the aim of avoiding accidents but facilitating traffic congestions. Let the police make it a law every hour of the day and on every street of the city that the slow-moving vehicle must keep to the curb. Every driver violating this should be arrested, because violations of this law cause as many accidents as speeding does. What is needed is that drivers of slow-moving vehicles "get the habit" of keeping in their proper place on the street, no matter what city they are in or no matter what part of the city they are in. Accidents always happen at the unexpected moment, and the cause of the accident at such times is due to the disregard of a recognized road law. Just as soon as the police make it imperative for all users of the streets and highways to obey every law of them, just at such time will all of these users get into the habit of doing the right thing all of the time and just in proportion as they do this will the number of accidents be reduced.

WHAT is needed today in the cities of America is a rational enforcement of the laws governing the use of the road and not more laws. The present regulations are adequate. What is needed throughout the land is more of the iron-clad New York and Chicago traffic regulation in the traffic centers, and these cities also need to extend this system to the less congested centers. The motorists living in Battle Creek, Mich., must get into the habit of using the highways properly, whether in his home city, in Detroit, in Chicago or in San Francisco. We want uniformity of traffic regulations, and uniform enforcement of these rules. At present the enforcement of laws is a traffic medley. This is well demonstrated in the recent issue of a club journal which gives tips as to the different regulations that are being enforced in the different towns and cities within the territory of the club. In one city speed traps are specialized upon; in another it is a muffler cutout ordinance that they watch for violations of; in a third the abuse of the horn is the center of attack; at a forth it is an absurd enforcement of a 12-mile an hour speed law.

SUCH intermittent, vascillatory enforcement of speed and traffic regulations will never bring the desired results, and will never result in creating in the minds of motorists and pedestrians that ever-present respect for laws which they should possess. What would be the respect in a certain factor of our population if our courts for months in the year allowed persons guilty of murder to go without punishment? What would be more damaging to our system of government if our laws were administered with an iron hand one season and let go in laissez faire fashion the next month? We would soon be in a condition of anarchy. What is true in our law courts is true in our traffic regulations: The driver of the horse vehicles will only obey the rational laws of the road when he knows that he will be punished, by fine or otherwise, every time he violates such laws; the driver of a motor car will only obey every speed ordinance when he feels that violations will bring penalties.

TODAY much traffic control in semi-suburban sections is vascillatory. It is at the whim of the corner policeman. Today he enforces the law as it should be enforced, but tomorrow he allows John Smith to cut the corner with his one-horse delivery wagon and a few minutes later arrests Tom Jones in his motor car for doing the same thing. The net result is that neither horse nor motor driver knows exactly where he is at. Neither does the pedestrian know where he or she is at. Today they wait patiently at the corner while the vehicle traffic moves at right angles to their direction, but tomorrow they try to rush in between moving vehicles. Tomorrow they attempt to cross between mixed-traffic on a congested street; they hurry from behind a slow moving horse truck to jump in front of a more rapidly moving motor van and an accident results. The speed of the truck is given as the cause. This is not right. There are three parties responsible, perhaps more. In the first place, the pedestrian is not immune; in the second place, the horse driver is not immune; in the third place, the motor van driver is not immune; and in the fourth place, the police department is not immune. All four are factors. Perhaps the pedestrian has not "got the habit" of properly looking to right or left; there is not a shadow of doubt but that he or she violated this recognized law. The horse vehicle, moving slowly, was not near the curb, as is necessary. The motor driver was going too fast for traffic conditions. Lastly, the policeman, responsible for the proper regulation of traffic, was not doing his job. The net result was an accident, and the faster moving motor vehicle was blamed for it. Where accidents occur in 99 cases out of 100 the cause is failure to enforce rules. It is not a case of not enough laws, but not enough enforcement. Get the public, whether in vehicles or on foot, in the habit of obeying the rational traffic rules and accidents will rapidly diminish.

Maine Fights to Stay on Motoring Map

Conference Held to Work for Highway Improvement to Attract Tourists to State

PORTLAND, ME., May 11—As a result of a conference held at the Falmouth hotel yesterday among prominent state officials, work will be started immediately to improve the state highways in an effort to prevent the motorists visiting New England sidetracking Maine in their journeys as they have in the past because the roads leading to the state from the New Hampshire line have been among the poorest stretches in New England. This has lost the state much money in the past.

The conference lasted 3 hours and every phase of the matter was thoroughly discussed. As a result Governor Plaisted has recommended to his council that the road between Bridgeton and Fryburg be put in shape immediately, the amount required being between $10,000 and $15,000 a portion of which will be paid by the two towns under the new law. This will mean that the important artery of travel leading to and from the White mountains in New Hampshire will be improved immediately. New Hampshire has its share of the road in fine shape and when the Maine portion is finished it will mean a fine road from Bretton Woods to Portland, by way of Poland Springs.

The other important link, and the one of greater importance to the state, is that leading from the New Hampshire line through to Portland. This has long been notorious as a bad stretch. Highway Commissioner Hardison stated that surveys were now completed for building 7,000 feet of road between Biddeford and Kennebunk. This will take care of the worst section of the strip that leads through the Kennebuck woods. Commissioner Hardison also announced that surveys were completed and bids were asked for the construction of 14,000 feet, or nearly 3 miles leading through Wells. Added to this between 2 and 3 miles in the town of York, will be constructed, while the road leading through Kittery will be resurfaced and the Ogunquitt-Cape Neddick stretch will be entirely rebuilt, too.

Biddeford and Saco will construct some roads in their territory. York already has voted $12,000 for the highways in that town and with all the officials working together it is expected that by July 1 the entire stretch between Portsmouth, N. H., will be in first class condition for motor travel. It has not been definitely settled yet whether any more permanent work on the main state highway between Portland and Saco will be carried out this year. However, with what has been planned now it means that motorists will not fear visiting the famous coast resorts of Maine in future.

Governor Plaisted expressed himself as being heartily in favor of a patrol system for the roads whereby a certain number of miles be allotted to a caretaker who would make daily trips over the stretch and note its condition and make reports so that breaks could be easily repaired before they become extensive. New Hampshire is going to adopt this system.

STATE GETS CRAWFORD NOTCH

Concord, N. H., May 11—Crawford Notch, the gateway to the White mountains in New Hampshire and one of the famous beauty spots in America, is to become the property of the state as a result of a decision handed down by the supreme court a few days ago. The state has been trying to secure possession of this stretch of property for some time and Governor Robert P. Bass and his council have been trying to purchase it. Some of the big timber owners in the stretch known as Hart's Location have been fighting the plan and they refused to set any price upon their property, meanwhile cutting away the timber. Governor Bass and his council made an appeal to the supreme court to appoint a commission to go over the property and assess damages upon it, and the court has granted the request, naming Edward G. Eastman of Exeter, Herbert G. Moulton, of Lisbon, and James E. French of Moultonboro. The state will now begin its surveys and the commission will make the award so that the property will be saved for all time to the people.

TRACTORS HAUL ROAD DRAGS

Bloomington, Ill., May 13—Gasoline tractors for hauling drags over country roads are being disposed of in many townships of Illinois, and are proving a great advantage over horsepower. Danvers township in McLean county was the first to adopt this plan, and the highway commissioners are well pleased with the showing. The annual expense of dragging a mile of road is $10, and Danvers township now leads all others in the county in relation to well dragged highways. The highway commissioners of central Illinois have reached the conclusion that voluntary dragging of the roads is too uncertain and that hereafter if the rural roads are to be maintained properly, that men with drags and tractors must be regularly employed for the purpose, to be paid out of the township fund.

MINNESOTA'S ROAD REPORT

Minneapolis, Minn., May 13—More than 12,000 miles of state roads have been designated in Minnesota, the annual report of the state commission will show. These are highways approved by the commission, as a result of which the state will pay one-half the cost up to the amount of the allotment for the year in which the road is built. Many counties have sought little aid from the state to extend and improve highways. Others have taken lively interest. The completed work in 1911 aggregated 371 miles distributed through the state. In addition were built 1,726 bridges, of which 1,508 are steel and 218 of concrete. More than $400,000 will be paid by the state to counties this year, including 1911 balances.

ANOTHER NEW ONE

Minneapolis, Minn., May 13—The Minnesota Valley Scenic Highway Association was formed Friday at Belle Plaine, with sixty delegates present, representing the route of the 100-mile highway from Mankato to Minneapolis, part of which is already constructed. This is a gravel-clay road, of which 12 miles from Mankato to Madison Lake is in use.

Coming Motor Events

May 18-19—Track meet; Colorado State Automobile Association; Denver, Colo.
May 25—Sociability run at Washington, D. C.
May 21—Sociability tour Denver to Indianapolis and return; Chamber of Commerce.
May 30—Hill-climb; Automobile Club of Danbury; Danbury, Conn.
*May 30—Indianapolis speedway, 500-mile race; Indianapolis, Ind.
*May 30—Track meet, Rockingham park; Salem, N. H.
May 30—Track meet, Washington, D. C.
June 6—Reliability run; Washington Post.
*June 8—Track meet; Quaker City Motor Club; Narbeth, Pa.
June 15—Track meet; Belmont Motor Club; Narbeth, Pa.
*June 20—Algonquin hill-climb, Chicago Motor Club; Algonquin, Ill.
*June 20-22—Reliability run, Pine Tree Motor Contest Association; Portland, Me.
June—Reliability run; Auto Club of St. Louis, St. Louis, Mo.
June—Hill climb; Maine Automobile Association; Portland, Me.
June 27-28—Interclub match, Chicago Athletic Association and Chicago Athletic Club.
June—Track meet; Baltimore, Md.
June 27-29—Summer meeting Society of Automobile Engineers; Detroit, Mich.
July 4-5—Track meet; Taylor Automobile Club; Taylor, Tex.
*July 4-6—Beach meet; Old Orchard Automobile Association; Old Orchard, Me.
July—Reliability run; Maine Auto Association.
July—Reliability run; Cleveland News.
July—Reliability run; Cleveland News.
July—Road race; Riverhead, L. I.
July 4—Track meet; Petersburg, Ind.
July 5-6—Road Race; Montamara Festo Auto Com.; Tacoma, Wash.
July 10-20—Canadian Industrial Exhibit; A. C. Emmett, manager motor section; Winnipeg, Can.
July 15—Reliability run; Wisconsin State Automobile Association; Milwaukee, Wis.
July 22-27—Cadillaqua celebration at Detroit, Mich.
*August 8-10—Galveston beach meet; Galveston, Tex.
*August 23-24—Road races; Chicago Motor Club; Elgin, Ill.
*September 2—Speedway meet; Indianapolis, Ind.
*September—Commercial vehicle run; Chicago Motor Club.
September 17-20—Fire engineers' convention; International Association Fire Engineers; Denver, Colo.
Sept. 23-Oct. 3—Rubber show, Grand Central palace, New York.
*October 7-11—Chicago Motor Club reliability run; Chicago.
*Sanctioned by A. A. A.

Denniston Company in Difficulties

Buffalo Concern Manufacturing Motor Trucks Files Voluntary Petition in Bankruptcy with Liabilities of $65,745.94 and Assets of $99,636.27—Weed Enjoins McKinnon

BUFALO, N. Y., May 13—The Denniston Co., manufacturer of commercial motor cars, tops and bodies for motor cars and other accessories, filed this morning a voluntary petition in bankruptcy with Clerk Petrie of the United States district court. The company has liabilities to the amount of $65,745.94 and assets totaling $99,636.27. This afternoon Judge Hazel in the United States court appointed Edward J. Barcale of this city as receiver. Bond, which was furnished immediately, was placed at $20,000. The receiver was directed to continue the business of the concern for a period not exceeding 30 days and to complete unfilled orders.

Most of the creditors of the Denniston company, which has office and factory at 1219 Main street, this city, are Buffalo corporations and individuals. The largest creditor is the Marine National Bank, which has claims aggregating $30,000. These claims are all on notes, the largest of which is one for $17,000. Walter H. Schoellkopf, of Buffalo, who loaned the bankrupt concern $4,500, is also a large creditor. The Schoellkopf claim is secured by three commercial cars which were turned over by the Denniston company at the time the loan was made. The notes of the Marine National Bank are unsecured.

The creditors will recover in full, it is stated by the Denniston officials, whether their notes are secured or unsecured.

Among the claims against the Denniston company are those for wages due employes of the concern. One employe has a claim for more than $200 wages while other employes claim wages totaling $650. The owners of the office and factory in which the Denniston company has been engaged have a claim against the concern for $3,833.35 for rent due on the premises.

The assets consist largely of stock in trade, machinery and tools, accounts receivable and unfinished work. The stock in the commercial car department is valued at $34,887.85, while the repair and body departments are valued at $20,186.74. The estimate on unfinished work, which includes labor and material, is $10,014.84. Machinery and tools are valued at $21,652.

Although the Denniston company is credited with having done big business, it is believed the officials of the concern exceeded their means in the expenditure of money in their efforts to carry on their work.

WEED ENJOINS McKINNON

Buffalo, N. Y., May 14—Upon application of the Parson Non-Skid Co., Ltd., the Weed Chain Tire Grip Co. and Harry Weed, Judge Hazel in United States district court this afternoon issued a temporary injunction restraining the McKinnon Chain Co., of Buffalo, from manufacturing and selling portions of a non-skid tire equipment. The application for the injunction was made on the ground that the McKinnon Chain Co. in the manufacture and sale of cross-chains infringed upon the patents held by Weed. The McKinnon people declared they did not infringe intentionally on the Parson patent, but Judge Hazel held that the presumption was strong that they were fully advised of the restriction relative to the manufacture of the Parson chain, and he granted the preliminary order.

KLAXON SUES MILLER

New York, May 13—The Lovell-MacConnell Mfg. Co., maker of the Klaxon horn, has entered suit in the United States district court against Charles E. Miller for infringement of patents 923,048-49 and 122, which cover basic principles of Klaxon horn construction. The suit is based upon claims that the Miller company has been handling electric horn devices alleged to infringe upon the Klaxon patents.

MORE DYER SUITS

New York, May 13—The Enterprise Automobile Co., of Hoboken, entered ten more suits in the United States district court last week for infringement of the Dyer transmission patents, and proceedings were started against George Rudy, Harmon S. Salt, Harlem Casino Taxi Service, Herman Grossman, Elias H. Kelley, John J. Ryan, Schuyler Schieffelin, Barton Sewell, John R. Keim and the Rapid Delivery Express Co.

REPORTS ON ELECTRIC CARS

New York, May 13—Estimating that the sales of electric cars and trucks in 1912 will be in the neighborhood of $40,000,000, T. C. Martin, chairman of the committee on progress of the National Electric Light Association, will report at the Seattle convention of that organization in June that the total amount invested in such vehicles will reach $80,000,000. He looks for the investment of 100 per cent in electrics before the end of the year.

A system of garage cards for consumers who use acid-lead batteries is described in Mr. Martin's report, the purpose of which is to determine the real efficiency of such batteries. Under this system it will be possible to work out a relation between the specific gravity of the electrolyte used in a given car and the number of miles the car can travel at any specific gravity.

An example is cited as follows: Where a certain pleasure car will run 72 miles on good streets when charged to a density of 1.289, it will go 60 miles at 1.260; 42 miles at 1.240; 36 miles at 1.220; 24 miles at 1.200, and 12 miles at 1.180. The battery becomes exhausted at 1.160. One-quarter of the present electrics are trucks and commercials.

ROSE SUITS DISMISSED

New York, May 13—Suits instituted by the Rose Mfg. Co. against Thomas Harper, American Auto Supply Co., Lowe Motor Supplies Co. and the Cox Brass Mfg. Co. for alleged infringement of the Rosenbluth patent on license and lamp brackets were dismissed on motion of the complainant. Before Judge Holt, of the United States district court, the dispute was as to whether the suits should be dismissed without prejudice and with leave to renew them. The court held adversely to the complainant company and taxed the costs of action against the Rose company, except as far as such action applies to the Cox Mfg. Co. The other cases were set down for hearing on the pleadings earlier in the term of court, which status had not been reached prior to the argument by the Cox company.

FRONTIER ELECTS OFFICERS

Buffalo, N. Y., May 14—The Frontier Tire and Rubber Co., manufacturer of tires and sundries, has just completed the organization of its plant here and during the past week officers were elected. Orson E. Yeager, head of the Buffalo Chamber of Commerce and president of the Victor Motor Car Co. of this city, was chosen president of the Frontier company. Other officers include: First vice-president, Frank V. E. Bardel; second vice-president, John W. Gibbs; treasurer, George T. Roberts; secretary, M. F. Dirnberger; general manager, John N. Gardner. Together with Charles F. Benzing of Buffalo, all of the officers comprise also the board of directors of the manufacturing rubber concern. New machinery has been installed in the plant at 1400-1414 Niagara street.

GASOLINE ADVANCES

New York, May 14—Gasoline advanced ½ cent a gallon today in response to the recent increase of 2 cents a barrel in crude oil. This makes a total advance of 4½ cents a gallon since the first of the year. Broadly speaking, the whole upward movement means an additional cost of about 12 cents a day to all the car owners in the country.

VACUUM OIL CUTS MELON

New York, May 14—In a statement just issued to its stockholders the Vacuum Oil Co. says that the directors are planning to declare a dividend in two installments, amounting to 6 per cent on a capitaliza-

More Drivers Picked for Hoosier Race

tion of $15,000,000. During the past winter the company increased its capitalization from $2,500,000 to the present figure, and it is expected from the latest announcement that the regular rate of payment will be 3 per cent quarterly hereafter. According to its statement, the company is doing a business which has largely increased everywhere in the world that it has branches except in Austria. In that country governmental discrimination in favor of Austrian refineries has caused some losses.

FIRE LOSSES IN APRIL

New York, May 11—Pertinent to the industry in connection with fire losses for April, according to a list compiled by the Journal of Commerce, the following shows an aggregate of $378,000; Boston, Mass., supplies, $20,000; Cambridge, Mass., garage and motor cars, $10,000; Chicago, garage, $12,000; Detroit, Mich., garage and motor cars, $35,000; Great Falls, Mont., garage and motor cars, $46,000; Hyannis, Mass., garage and motor cars, $45,000; Ogdensburg, N. Y., garage and motor cars, $200,000. This is 2.36 per cent of the losses incurred during the month, and only seven fires out of 259.

HOWARD SUCCEEDS BENSON

Detroit, Mich., May 13—The Cadillac Motor Car Co. announces the appointment of E. C. Howard to the position of sales manager to succeed E. R. Benson, who has joined the Studebaker Corporation's staff as sales manager in place of Paul Smith, gone with the Everitt. Mr. Howard's connection with the Cadillac company dates back some 5 years, of which the last 3 have been in the capacity of assistant sales manager.

CRUDE RUBBER LOWER

New York, May 13—A very general decline in the price of crude rubber in the world's markets this week resulted in a drop in the New York market to a basis of $1.09 for up-river fine. Trading was featureless and on a small scale, and such quotations as were given were largely nominal. Six hundred tons will be offered at the London auction. So far this year plantation offerings at auction have amounted to 5,946 tons, an increase of 2,350 tons over the corresponding period for 1911.

LORD MONTAGU COMING

New York, May 13—Lord Montagu, editor and publisher of The Car, one of the noted British motor publications, is due to arrive in New York this week for a tour of inspection covering the American motor industry. He will make quite a complete circuit of the typical American plants and will investigate all the conditions that surround making, selling and using cars in this country.

Bruce-Brown and Joe Dawson Will Pilot Nationals in 500-Mile Event—Barndollar Tries to Hold White Job by Injunction but Fails—Fast Time in Practice

INDIANAPOLIS, Ind., May 14—Most of the drivers and cars entered in the Memorial Day race at the Indianapolis motor speedway have arrived for practice, and while most of the machines are new and the motors stiff, some extraordinary outbursts of speed have been made.

David L. Bruce-Brown and Joe Dawson, the latter well known as a Marmon driver, have been added to the National team for the race. This will be the first time Bruce-Brown has driven other than a foreign machine. The addition of these two drivers gives the National people four drivers, the others being Howard Wilcox and Don Herr. The latter will be relief driver.

The White six has been sent back to the factory for some minor changes, and there is much speculation as to who will drive the car. Winfield J. Barndollar obtained a temporary restraining order against the local White agents, prohibiting them from employing another driver until May 21, but today the court threw out the case because Barndollar did not file a $1,500 bond. Lee Oldfield has been negotiating with the White people, and Joe Dawson also negotiated with the White agents, but finally decided on the National.

The National and Stutz entries are all at the speedway practicing. Others who have arrived are Joe Horan, Lozier; Bill Endicott, Schacht; Dingley, Simplex; de Palma, Mercedes; Knight, Lexington; Mel Marquette, McFarlan six; Liesaw, Marquette-Buick; Tetzlaff, Fiat. Ralph Mulford is driving overland from Springfield, Mass., in his Knox. Bill Endicott has announced that his brother, Harry Endicott, will act as his relief driver. Len Ormsby will drive the Opel.

Practice work has been delayed somewhat by inclement weather. There were heavy rains Saturday night and Sunday. Practicing, however, was on in earnest yesterday afternoon and today. Wilcox says he made one lap of 2½ miles in 1:38. Burman has made laps in 1:50 in his Cutting, and de Palma, in a lively skirmish with Merz in a Stutz, yesterday afternoon turned a lap in 1:51. Laps in 1:50 have been about the average.

Several drivers are trying out wire wheels. Burman is using them on his Cutting, Jenkins has ordered a set for his Continental, and the National drivers are going to experiment with them. If wire wheels prove successful, several cars may use them in the race.

Practically all hotel reservations have been taken for the race, but the speedway management, following its custom started last year, is conducting a room bureau and will be able to furnish thousands of visitors with rooms in desirable homes. Next year there will be little difficulty in getting sufficient room in hotels, as half a dozen big hotels are either under construction or will be within the next 60 days.

Chicago, Detroit, Denver and Milwaukee are arranging big parties to attend the races. Denver and Detroit will drive here, while the other two will have special trains.

The Findeisen & Kropf Mfg. Co., of Chicago, maker of the Rayfield carbureter, offers $1,000 to the winners, provided Rayfields are used. Emil Grossman offers $1,000 to the winner, $250 to second and $100 to third, providing Red Head spark plugs are used.

MILWAUKEE RACE PLANS

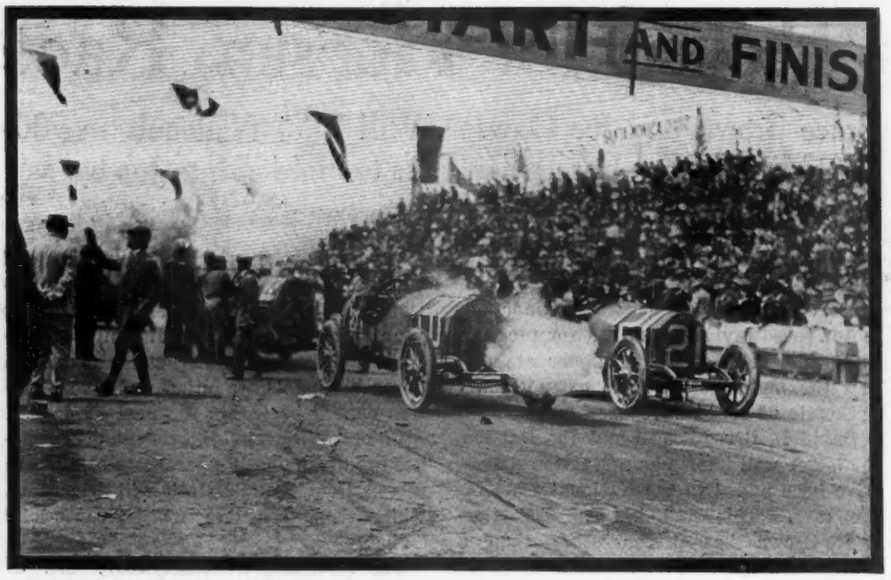
Milwaukee, Wis., May 15—The actual work surrounding the running of the big road race carnival in Milwaukee in September, with the Vanderbilt cup and grand prix trophy contests as features, will be put under way at a special meeting of the Milwaukee Automobile Dealers' Association on Thursday evening. Beginning Friday morning, the association will hustle to get everything in shape for the American road classics.

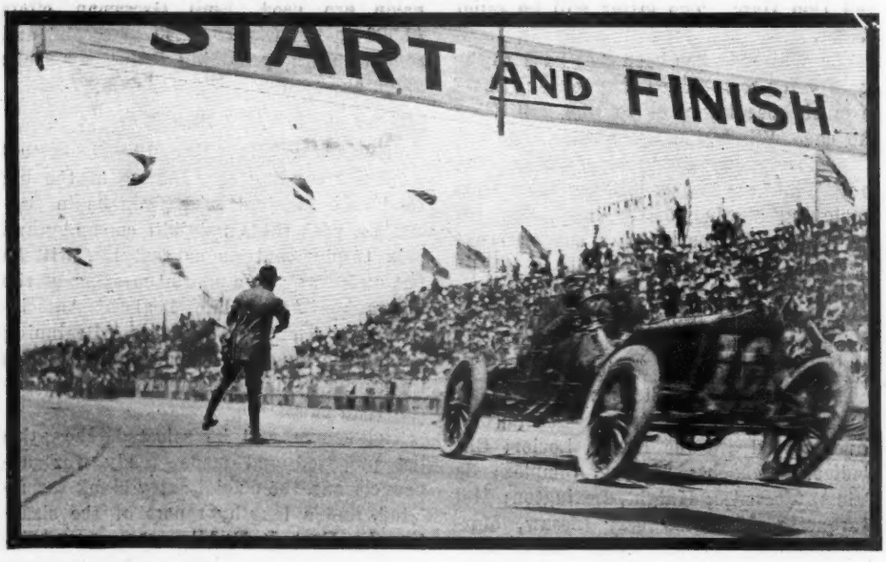
The course will be selected, the prize list prepared and made ready for announcement, the official entry blank formulated, and a lengthy report of the situation by Bart J. Ruddle, race secretary, who has just returned from a trip to Santa Monica and other western points, will be made at the meeting Thursday evening. The final fixing of the dates of the two big races and the light-car events also will be done.

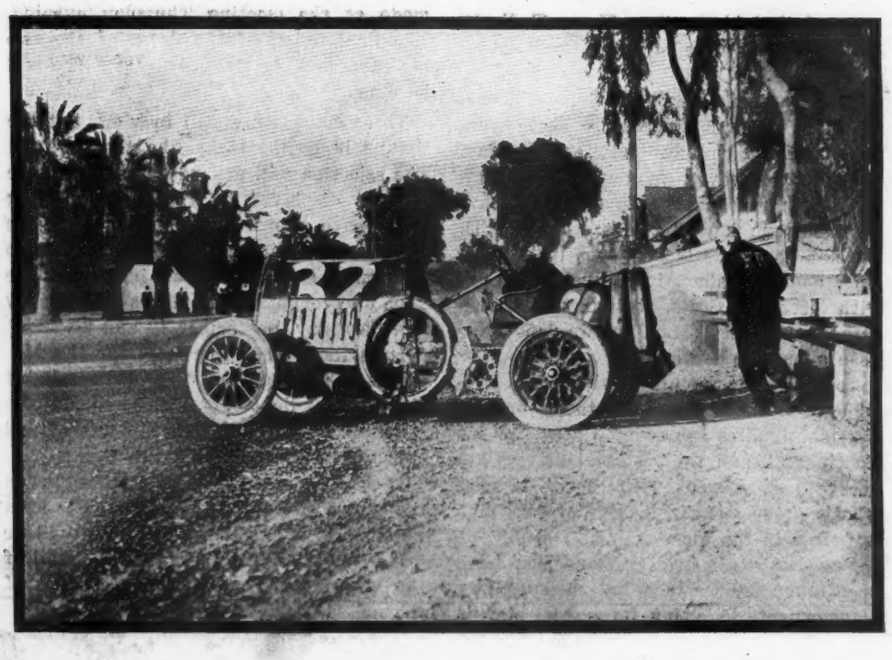
Three courses are still in view, but the Greenfield course looks like the favorite. The selection will depend mainly upon the interest displayed by the farmers living along each proposed route, and petitions have been in circulation for some time to determine the amount of interest. The dope on probable dates makes it Thursday and Saturday, September 19 and 21.

It is likely that the races for the Milwaukee Challenge and the Gustave Pabst trophies, for light cars, will be run in conjunction with the Vanderbilt and grand prix races, one on each day.

It has been decided to start work on the course on Monday, May 20. The need of haste is apparent, and no time will be lost in completing this important detail of the vast amount of work the conduct of the racing carnival requires.







Santa Monica's Future

Financial Risk Likely to Scare Off Race Promoters on the Coast

LOS ANGELES, Cal., May 8—The breaking of the world's record on the Santa Monica course by Teddy Tetzlaff in the Fiat did not come as a surprise. This course has long been recognized as one of the fastest in the world, and as there were five of the fastest of racing giants entered in addition to the slower cars, it was almost a certainty that one of these cars would last for a record. Bragg and Brown were all going well at the finish and all three beat Herrick's mark, Tetzlaff getting 78.7 miles per hour.

There is a strong possibility that after 4 years of racing on this course the Santa Monica will be abandoned for several years at least and possibly for all time. The life of a road racing course seems to be from 4 to 6 years. Santa Monica has had its fling, and as road racing is not a success from the standpoint of a private promoter, it will not be easy to find men who will take the risk.

The Los Angeles Dealers' Association handled the race last year, but this spring A. M. Young took entire charge as a private promoter. His plans and contracts were well made, and with permission to charge every person who crossed the bridge into the inside of the course, he had prospects of making money, but at the last minute the city officials of Santa Monica refused to permit a charge at the bridge and more than 50,000 passed over without payment.

At the last minute the race was almost called off. Manager Young said he would abandon the meet if this source of revenue was cut off. This was at midnight of the day of the race and Young retired for a few hours' sleep with the understanding that his plans would stand. When he came to the course in the morning all the fences had been removed and crowds were pouring in. He was permitted to charge for admission to the grand stand, but fifty times as many people saw the race around the course.

The week following the race there was a general exodus of drivers for the east. Indianapolis is the attraction. Charlie Merz left for Indianapolis and Bert Dingley went back with his Simplex. Tetzlaff also has gone and will drive his big Fiat at Indianapolis.

Scenes in connection with the Santa Monica road races are depicted herewith. The top illustration shows the start of the free-for-all, Nos. 20 and 21 being the two Stutz cars which were running at the finish. The middle illustration shows the Maxwell winning the 161-230 class race, while the bottom picture is Tetzlaff changing a tire on the last lap, just after he had smashed into an iron railing which threatened to put him out of the race.

Hopes to Save Park Races

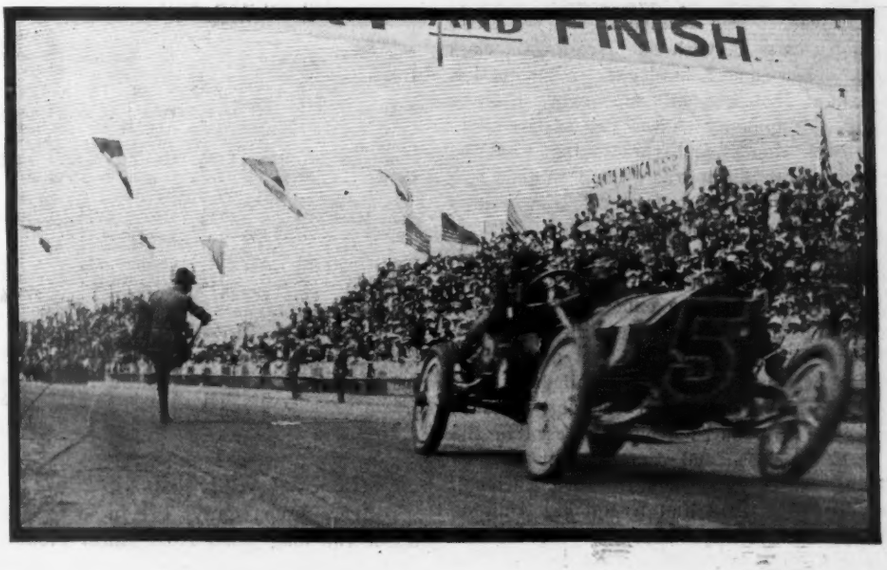
Quaker City Motor Club May Petition Commissioners for Rehearing

PHILADELPHIA, Pa., May 11—Turned down last Wednesday by the Fairmount park commission, which declined to issue a permit for the 1912 Fairmount Park road race, the Quaker City Motor Club has not entirely abandoned hope. So far there has not been any talk of seeking another course. Instead the club hopes to circulate a petition which it thinks will be signed by many thousands of enthusiasts that may lead the commission to reconsider its action. Also it is thought that the permit may be secured by going higher up—appeal to the power that created the commission and secure a reversal of the decision which has cast such a blight on the motoring community.

The possibility of holding the Fairmount Park road race outside the city limits is dismissed as unworthy of consideration on account of the many obstacles presented, first and foremost of which is the enormous expense that would be attached even if there were a suitable course, which there is not.

The great success attending the event each year has been due to the fact that with the co-operation of the municipal authorities some 2,000 policemen were stationed at frequent intervals along both sides of the course, ensuring a maximum amount of protection. With this source of protection no longer available, it would be necessary to fall back on the soldiery and the cost of maintaining a body sufficiently large to adequately police the race, together with an outlay of about $7,500 in prizes, would stamp the event a losing venture from the start. Then, too, supposing for the sake of argument a course could be found, no facilities like those afforded by Fairmount park could be obtained. In the park the course always is in excellent condition, it is accessible from all parts of the city and has natural advantages that could not be compensated by any other location.

Secretary Clarence Cranmer, when questioned regarding a possible chance of the race being held in the vicinity of Philadelphia, said that while loath to abandon the race, no official action looking to that end had been taken, nor was any contemplated at the present time by the officers of the club.



The top illustration shows Teddy Tetzlaff in the Fiat, just after he had won the free-for-all in which he succeeded in establishing a new world's record of 78.7 miles per hour. The middle picture was taken as Ralph de Palma in a Mercer flashed across the tape, winner of the 231-300 class. At the bottom is David Bruce-Brown, third in the free-for-all, in a Benz, making a quick tire change, assisted by his mechanic, on the back stretch at Santa Monica

Pope and National Share Atlanta Glory

Georgian Hill-Climb, After Several Postponements, Finally Run Off, Handicapped by Rainy Weather—No Records Are Broken but Contests Were Interesting—Flanders and E-M-F Among the Other Winners

ATLANTA, GA., May 11—Atlanta's hill-climb, the fifth in 6 years, after several postponements and a lingering start, got away finally this afternoon to a real success. Everything went wrong with the preliminary arrangements for the climb. For one cause or another it was postponed several times, and before it was finally arranged there was a strong argument among the committeemen appointed by the Atlanta Automobile and Accessory Association as to which class the affair should be run under—an argument so heated that it threatened to break up the event. Finally, however, it was decided to run the climb under class C, with one free-for-all, class D. Then came a hard chase after entries, a hunt that was only moderately successful. And finally on the day of the climb it was cloudy and threatening. In the face of all this it was a good climb. Two of the events were well filled and three offered good competition.

The climb, once started, ran smoothly enough, and with as little real excuse for thrills as was to be expected of a climb straight up a 3.61 grade hill, without a bump in the entire 4,716 feet and over a perfect macadam road, well oiled.

The chief interest of the day centered around the fourth event, for cars in the 301-450 class, and the free-for-all. In both the real contenders were a National, a Pope-Hartford and a Buick. And, as not infrequently happens, the second event offered a reversal of form. The 301-450 event was won by the Pope-Hartford in :51⅖, with the National second, in :54⅗. The Buick was third. These same three cars went immediately down the hill again and once again climbed to the crest, only to reverse the decision. This time, in the free-for-all, the National proved the fastest and won in :53⅗, with the Pope-Hartford second by ⅖ second and the Buick again third.

The mark of the Pope in the fourth event, however, was the best of the day and gave the car one leg on the Automobile and Accessory Association cup, offered for the fastest time. Owing to the fact that the course started 75 feet further from the bottom of the hill than in other climbs and that piston classifications governed, instead of the price classifications used in past events, there was no satisfactory way of comparing the time made in this climb with that of previous years. However, there was nothing in the way of speed demonstrated that threatened the old records. The :45⅘ set by Lambert in a White steamer in 1909 was not approached, nor was the gasoline car record of :47⅘ made by Almand, driving a Simplex, in 1910. If the National had gone over the shorter course at the same proportionate rate its time would have been :50⅗, 2⅖ seconds worse than the time made by the Simplex.

The first motor car climb run was event 2 for the 161-230 class. This was comparatively easy for E. H. Odum in an E-M-F, with Fords second and third. There was no competition in the under-160 and in the 231-300 classes, only one car finishing in each. Summaries:

160 INCHES AND UNDER

Car	Bore and Stroke	Driver	Time
Flanders	3⅝x3¾	Lundgren	1:00⅘
Hupmobile	.....	L'Engle	*

161-230 INCHES

E-M-F	4 x4½	Odum	1:00⅖
Ford	3¾x4	Abbott	1:04
Ford	3¾x4	Teasley	1:11
Overland	3¾x4½	Lenney	1:22⅕
Ford	3¾x4	Baggs	1:29

231-300 INCHES

Pope-Hartford	4 1/16x5⅛	Bennett	1:20
Dorris	4⅝x5	Leathers	*

301-450 INCHES

Pope-Hartford	4¾x5½	Crane	:51⅖
National	5 x5 11/16	McKerall	:54⅗
Buick	4½x5	Norman	:55⅗

Events Nos. 5 and 6 did not fill.

JOURNAL CUP—FREE-FOR-ALL

National	5 x5 11/16	McKerall	:53⅗
Pope-Hartford	4¾x5½	Crane	:54
Buick	4½x5	Norman	:55⅕
Flanders	3⅝x3¾	Lundgren	1:00⅕
Dorris	4⅝x5	Leathers	1:10

*Did not finish

DENVER WILL HOLD MEET

Denver, Colo., May 11—In order to break the long jump from Santa Monica to Indianapolis, a number of the racers who have been performing on the California coast for the last few weeks will stop in Denver to give a series of exhibition races May 18 and 19 at Overland park. Louis Disbrow will give a time exhibition in the Jay-Eye-See. Joe Nikrent will be here with the Case in which he finished second in the Santa Monica races. The Simplex and Fiat also will be seen. Fred Wagner will act as starter and Ralph W. Smith, president of the Colorado Automobile Association, will referee.

BIG TRACK FOR SALEM

Boston, Mass., May. 11.—The New England Aviation Co. has leased Rockingham park at Salem, N. H., and it has had plans drawn up to extend the track there so that it will be 2½ miles in length. After the races on May 30 work will begin at once to make the track as fast as possible. The foundation for the work is all ready as the park was built at a cost of more than $1,000,000 by a syndicate of wealthy New York horsemen headed by James R. Keene, but horse racing there was a failure because no pools were allowed to be sold.

Harry Grant, twice winner of the Vanderbilt cup, has been secured to manage the May 30 races and already he has secured promises from a number of Boston motorists to enter the events. There will be amateur and professional races at varying distances on the coming holiday.

The big event, a 300-mile race, however, is planned for Columbus day, October 12. This is a state holiday in Massachusetts and it is believed that as there will be no other big races on at that time, some of the big cars and star drivers will be secured for that day. Salem is only about 30 miles from Boston and it is as easy to reach it from Worcester, while a lot of motorists could drive there from all over New England easily. The facilities for garaging the cars are admirable, too, so that it has everything in its favor.

WOLVERINES TO BUILD

Detroit, Mich., May 11—The Wolverine Automobile Club, at a meeting held last Saturday night, approved plans for a clubhouse to be erected at John R. street and Madison avenue. It will be eight stories high, with a basement and a roof garden, and will be used almost exclusively for club purposes. Ten per cent of the money necessary for the construction of the building and the purchase of the land has already been subscribed by about 100 of the 1,500 members. The total cost is estimated at close to $500,000.

The project will be capitalized and the stock sold to raise the necessary funds. This will necessitate a reorganization of the club. It already has been decided to limit the membership to 1,500 and to increase the dues from $6 to $40 a year when the building is occupied. Every member must own at least one share of stock.

NEW TAGS FOR RHODE ISLAND

Providence, R. I., May 11—At a special meeting of the state board of public roads of Rhode Island the board, acting under the new law recently passed, has decided that all motorists in the state must take out new license plates within 3 months. The board has ordered that the new plates shall be of white with the letters and numerals of black. Instead of the letters R. I. being at the end of the plate following the numbers they will be at the left hand side preceding the figures. The R will be above the I instead of preceding it as on the old plates. Manufacturers will have plates with an X to denote that they

are not private cars. The new plates will be 12 inches long by 4½ inches high instead of 14 by 5½ as were the old plates. The new numbers will be not less than 3 inches high and as wide as possible to make them easily distinguishable. The motorists who now hold registrations will be given the new plates free in exchange for their old ones.

This change in plates was brought about by complaints from the police departments in Rhode Island whose officials stated to the board that when cars were running very fast the letters R I very often seemed to be merged into 81 and this made it difficult to pick out a number for prosecution.

TAFT FAVORS REVISION

Washington, D. C., May 11—President Taft has taken a decided step toward revision of the patent laws, which have remained practically unchanged since 1870. He has sent a special message to congress asking for legislation to authorize him to appoint a commission to investigate the patent laws and report what changes were necessary to make them fit modern conditions. The president gives several reasons to show the need for a change.

WOULD NUMBER FARMS

Kenosha, Wis., May 13.—The Kenosha Automobile Club of Kenosha, Wis., is working on a plan of districting the county of Kenosha, which will greatly facilitate travel and make it as easy to find a farmhouse as it is to find a city residence. The plan is a new one in Wisconsin and is attracting state-wide interest.

The Kenosha club plans to block all highways in the county, then name each and number the farms. The main features of the plan are outlined as follows by Russell H. Jones, secretary:

1—The roads of the county are first carefully studied by experts, and then aligned or arranged into the fewest and longest lengths suitable for naming and blocking.

2—To each road, as aligned, is given a short, euphonic name.

3—The roads then are blocked, which consists of carefully measuring them along the surface, giving traveled distances, and divided into miles, which are then subdivided into tenths of a mile or imaginary blocks of 528 feet of road frontage. The blocks are then numbered, commencing at the end of the road nearest the county seat, and the block numbers are taken as the basis for numbering farmhouses.

The proposition has been taken up by the Kenosha county board of supervisors and is receiving support all along the line.

BADGERS PICK CASE PATHFINDER

Milwaukee, Wis., May 12—The contest board of the Wisconsin State Automobile Association has selected a Case touring car to act as pathfinder for the route of the third annual Wisconsin reliability tour, which will be held during the week of July 15. The selection was made by lot from a score of bids from state agents. The 1912 tour will be conducted under grade 3 rules of the A. A. A., instead of under the severe grade 1 rules used for the first two events. The run will have as its main object the promotion of motoring, organization and selling. The W. S. A. A. will make it a week of organization meetings, enthusiasm over highway improvement and promotion of legislation in preparation for the next session of the legislature in January, 1913. The tour will probably be a 5-day affair, covering from 800 to 1,000 miles. Among the cars already tentatively entered are: Mitchell, Case, Oakland, Overland, Cadillac, King, Kissel, Staver, Michigan, Ford, Reo, Warren, Marion, Regal, Westcott, Buick and Hupmobile.

BAY STATE BILLS DELAYED

Boston, Mass., May 11—It begins to look now as if the proposed motor legislation with which the committee on roads and bridges of the Massachusetts legislature has been wrestling since the session opened may be turned over to a recess committee for consideration. As a result of the criticism aroused over the increase in truck fees and the weight and speed limits on trucks which resulted in the bills being recommitted to the committees twice after they were reported to the house, the subcommittee now in charge of the bills does not know which way to turn. Chairman Eldredge of the senate committee has had a conference with the speaker of the house and the president of the senate on the proposition to appoint a recess committee to consider the matter.

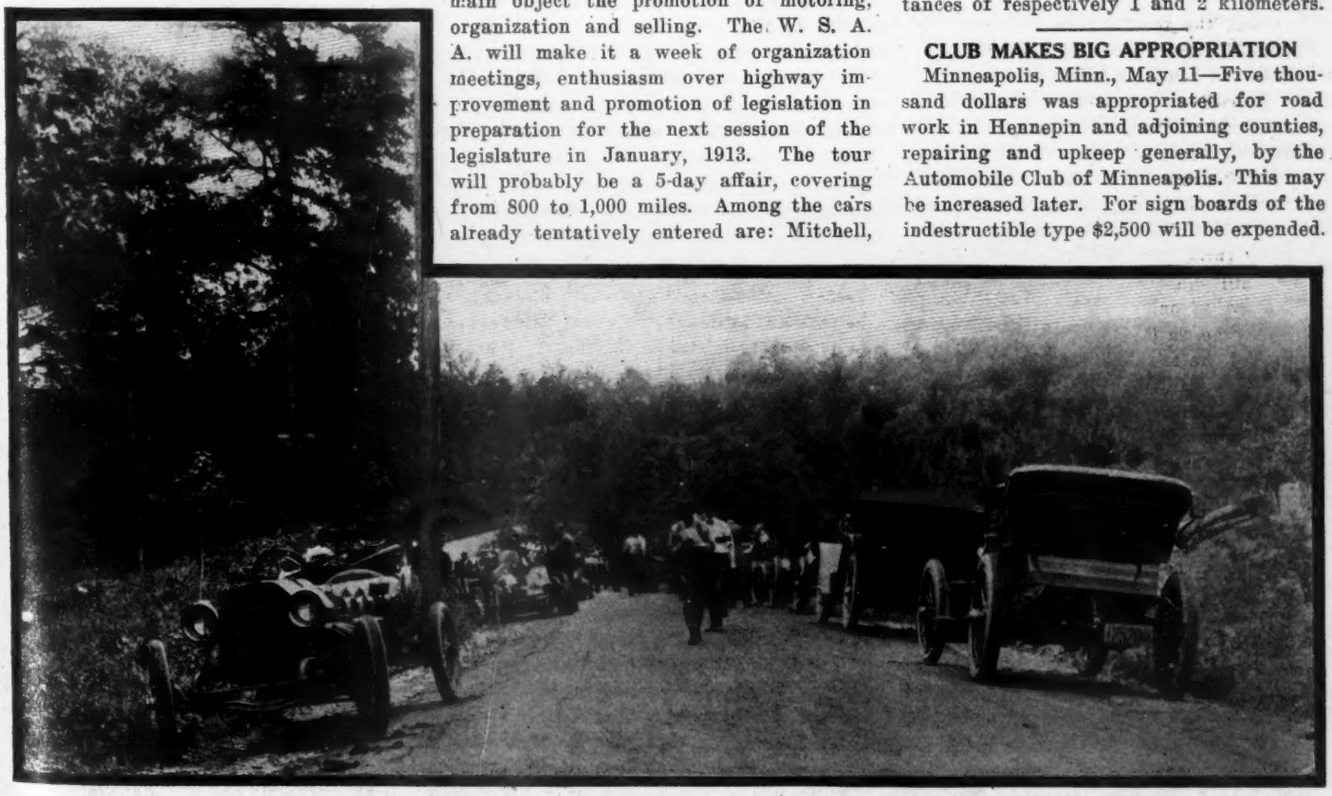
The bill that would make it mandatory to use only horns that would make an abrupt sound finally lost out in the house by a vote of 60 to 58 after it had made its way into the legislature against an adverse committee report.

SARTHE CLUB BILLS CLIMBS

Paris, May 1—In addition to a long-distance road race for 3-liter cars next September, the Automobile Club of the Sarthe intends to hold a meeting in the neighborhood of Le Mans on May 26 and 27, with $2,000 in prizes. The events will comprise two distinct hill-climbs, over distances of respectively 1 and 2 kilometers.

CLUB MAKES BIG APPROPRIATION

Minneapolis, Minn., May 11—Five thousand dollars was appropriated for road work in Hennepin and adjoining counties, repairing and upkeep generally, by the Automobile Club of Minneapolis. This may be increased later. For sign boards of the indestructible type $2,500 will be expended.



SCENE BEFORE START OF THE HILL-CLIMB AT ATLANTA, GA.

Crop Prospects Raise Hopes of Texans

Reports of Possible Bumper Harvests Makes It Look as if Lone Star State Will Take Many Cars This Year—Wheat, Corn and Cotton Are Flourishing

AUSTIN, TEX., May 11—Viewed from the standpoint of unusually favorable prospects for all kinds of crops, the motor car trade situation all over Texas hardly could be brighter. Not for many years has the outlook for bumper harvests been more propitious at this season of the year than now.

From every section of the agricultural portions of the state come glowing reports of the condition of different growing crops. In the panhandle and north Texas territory wheat is looking fine and a total yield of approximately 18,000,000 bushels for the state is promised. This will be about 6,000,000 bushels more than was raised last year. The total oats production will be upwards of 50,000,000 bushels, it is estimated. Excessive rains in the planting season set back corn somewhat, but on the whole it promises a good yield. Cotton hardly could give better promise of a big yield and it is predicted by men who are familiar with the situation that the yield of that staple this year is likely to be in excess of 4,000,000 bales, or about what it was last year. The east Texas peach crop will be one of the largest for several years. The same is true of the tomato crop, which is an important factor in the prosperity of the people of a large section around Jacksonville, Palestine, Rusk and other places. The truck growers of south Texas, particularly the cabbage, Bermuda onion and Irish potato farmers, are receiving unusually large returns for their crops. In the rice-growing belt conditions are also good. Oil, live stock and other interests are prosperous.

Everything considered, indications point to an unprecedented year of production and prosperity for Texas. That this highly desirable condition is realized and appreciated by the motor car dealers in all parts of the state is shown by the preparations that most of them are making for doing a big business when the money comes in from the harvests of the crops. It is stated that larger orders for cars are going out of Texas at this time than in the history of the industry. It is a safe prediction that more cars will be sold in Texas during 1912, by several thousand, than during the previous year.

When the farmer is prosperous business of all kinds is good. Of course, it is possible that there may be unexpected and unforeseen damage done present crop prospects, but this is considered very improbable as to cotton, wheat and oats. Even with a complete failure of all other kinds of crops, prosperity is always assured the people if the cotton production is large and good prices for the staple prevail.

One of the things that forbodes a large trade in motor cars is the increase of interest that is shown in the vehicles by people who are in position to buy them. Among farmers and ranchmen of Texas motor cars are being rapidly adopted as the chief means of ordinary transportation. They are rapidly displacing the horse vehicles in the rural districts all over the state.

OUTLOOK IN NORTHWEST

Minneapolis, Minn., May 11—Crop and financial conditions in the northwest are covered in the monthly review by the Northwestern National Bank. Among other observations the magazine, which is held him as authority says: "In the northwest there is a general feeling that this year will be a prosperous one, for all indications at present point toward a good yield of all the important products of this great agricultural district. An abundance of rain last fall, a rather late spring with plenty of moisture, and no set-backs, occasioned by chilling frosts, is the concensus of reports received from all directions, and an optimistic spirit is evident everywhere, as brought out by the interviews with well informed bankers and business men from all parts of the northwest. We see, so far, no occasion to change the opinion expressed in our December number that this will be a quiet but satisfactory year in business."

BLOOMINGTON SATISFIED

Bloomington, Ill., May 13—A somewhat pessimistic writer in Motor Age, using a Springfield, Ill., date line, may have reflected business conditions accurately when he referred to Sangamon county alone, but he was sadly mistaken in respect to other sections of central Illinois. The present year has been a banner one for the dealers of this district, breaking all records for sales through this territory. There has been no reason for discouragement here and the future appears even brighter than the first half of the year. While it is true that the winter was long and cold and spring somewhat retarded, yet buyers have not been deterred from placing orders and all of the local agents express themselves as well pleased with their season's business to date.

J. L. Murray & Co., of this city, agents for the Overland and distributors for the central Illinois territory, have more than doubled their business this year, disposing of fifty car loads. C. U. Williams & Son, who handle the Moon, Chalmers, E-M-F and Stearns, together with the Woods electric, doing a strictly non-jobbing business, have disposed of fifty cars so far this year. Floyd Izeminger, agent for the Ford, has sold 100 so far this year, doubling his business of last year, and has numerous orders ready to fill when the cars can be secured. The agents for the Cadillac, Everitt, Cole, Marion, Mitchell, Buick, Warren-Detroit, and Davis have in every instance sold more cars than last year, while in the case of some, notably the Mitchell, the sales have doubled.

Fifty electrics have been sold in this city and vicinity this year, twice as many as last year. It is true that the sale of the high-priced cars has been slow. Nine-tenths of the buyers fix $2,000 as their maximum, and the $3,000, $4,000 and $5,000 cars are the exception. Dealers who handle cars which cost more than $2,000 report very few sales, all agreeing that nine-tenths of the farmers want cars costing less than $1,000, and nine-tenths of the city buyers selecting those which can be sold all the way from $1,500 to $2,000.

Central Illinois has been prosperous, due to the high prices of all farm products. The rainy spring has retarded corn planting and there is some worriment over a possible decreased crop, but a corn crop failure in central Illinois is such a rarity that the majority are unconcerned. The Bloomington and central Illinois dealers, as already stated, are not disheartened over the year's business, but on the contrary they anticipate many more sales during the remainder of the summer.

MINOR SHOW CIRCUIT PROPOSED

New York, May 11—The National Association of Automobile Manufacturers has determined to form a minor show circuit next winter and to work out the details of the scheme the N. A. A. M. show committee will invite promoters to meet them and discuss the proposition.

Following the meeting of the executive committee May 1, the following statement relative to the scheme was issued by the N. A. A. M.:

"For the last 2 months work has been progressing with a view to curtailing the number of local shows, which have grown beyond all reasonable bounds, or of enabling the manufacturer to resist the demands made upon him. Under the rules of the association no manufacturer, as such, may take part in a local show, but in the event that his dealer takes space he may send a show chassis, a salesman or salesmen, literature and contribute to the advertising. With upward of seventy local shows in the field the manufacturers found the call upon them too severe a burden.

"The association will not attempt to prevent the holding of any local show, but

it will form a circuit embracing the principal cities, so arranging dates that they will not conflict, and that each show in the circuit will be assured of a reasonable amount of cooperation on the part of the manufacturers. It is quite conceivable that under these circumstances manufacturers will deem it advantageous to confine their attention to circuit shows almost exclusively."

The N. A. A. M. also has decided to give the makers of electric cars more recognition hereafter in the Chicago show and with that end in view it will organize a distinct electric vehicle section, which will be located in the First Regiment armory, where ten of the best spaces will be set aside. Allotment of space in this section will be made by or under the supervision of the electric vehicle committee of the association.

GOODYEAR CHANGES

Akron, O., May 11—The following changes have been made in the sales organization of the Goodyear Tire and Rubber Co.: William M. Boggs, formerly salesman at Philadelphia, is now working territory in the state of New Jersey, and H. G. Bruning has been appointed motor truck salesman in Cleveland. F. H. Findlay, formerly salesman at the New York branch, is now motor truck and solid tire salesman out of the Brooklyn branch, and J. B. Linerd has been transferred from the New York branch to travel out of Brooklyn as solid and motor truck tire salesman. H. Morton, formerly at the Chicago branch, will cover the territory in Illinois formerly covered by H. L. Lawson, and R. H. Campbell, formerly of Chicago, will take the territory formerly covered by Mr. Morton.

The following additions have been made to the selling organization of the company: Henry W. Hoklas, to travel out of Minneapolis branch; D. H. Cottrell, motor truck tire salesman out of Buffalo branch; R. S. Grant, out of Cleveland branch, and I. S. Roberts to travel through eastern Missouri out of the St. Louis branch of the company.

EXPORTED FROM LONDON

Washington, D. C., May 12—The declared exports through the London consulate general to the United States for the 3 months ended March 31, 1912, aggregated $41,777,327, as compared with $28,885,267 for the same period last year. Motor cars and parts amounted to $107,138, an increase of $40,433.

GERMANY TALKS TARIFF JUMP

New York, May 13—A cablegram from Berlin states that a number of prominent German motor car manufacturers have suggested to the government that, owing to the growing competition of Americans, that the German tariff on motor cars should be increased.

Utah Dealers Scoff at Backward Spring

More Cars Reported Sold in First 4 Months of This Year Than Ever Before in History of Business—Smaller Towns Buying Liberally Feature of the Trade

SALT LAKE CITY, Utah, May 13—In spite of a backward spring where weather conditions have been greatly adverse to the sale of motor cars, it is confidently expected 1912 will be a banner year in the motor car business in the intermountain west. There is no use of trying to deny the fact that rain and snow has held back the sale of many a car, but in spite of this records will show that more machines have been sold in the first 4 months of the year than ever before in the history of the business.

The most prominent feature in this year's business is the number of sales going to the country and the smaller towns. This is true of Idaho, western Wyoming and eastern Nevada, which states buy all their cars through Salt Lake jobbers and dealers. Heretofore Salt Lake has consumed three out of every four cars sold in this territory and this year these figures will be easily reversed. Your western farmer—or perhaps the intermountain farmer would sound better—has been slow to adopt the motor car, but 1912 shows his as eager to accept it as the farmers of the Mississippi valley did a couple of years ago, when the first inroads were made in that territory. This, therefore, makes prospects much brighter.

This year sees more agencies located in Salt Lake than ever before and the dealers are now branching out for the country trade which in the past has been considered as not worth going after. One firm alone has placed seventy-five cars in this territory since February 1, while the same car handled by another dealer sold but thirty-five during the entire year of 1911. The sale of the higher priced cars keeps abreast with the demand for the cheaper ones. This is rather a surprising feature to the trade here, where just the reverse conditions were expected. It is safe to predict four sales to one will be made over the business done in this territory last year. However, 1911 business was poor and far below 1910, it is declared by the tradesmen.

PROSPECTS IN CONNECTICUT

Bridgeport, Conn., May 11—Dealers in this city declare that business during the month of April was the largest on record and the rush of orders was so great that many deliveries were impossible. Figures compiled by the four largest dealers in the city show that business during the month showed an increase of 21 per cent over that done during April, 1911. They believe this increase is due to the fact that many manufacturers of high standing have placed a medium-priced motor car on the market reducing the general expense of operation.

The greatest demand in eastern Connecticut this season has been for four and five-passenger cars of medium weight, although rakish roadsters capable of making high speed have found a ready sale.

Due to the poor condition of the roads, prospective buyers have sought cars having sturdy chassis hung moderately low. Dealers in this section, taken collectively, believe the season of 1912 will be a banner one.

SUSTAINS WISCONSIN OIL LAW

Sheboygan, Wis., May 13—The Wadhams Oil Co., of Milwaukee, Wis., operating numerous branches throughout Wisconsin, was convicted on twenty-six distinct counts of selling uninspected oils in the Sheboygan district. The cases were instituted in September, 1909, and the company was at that time found guilty on twenty-six of thirty-two counts.

The oil company contended that an injunction which has been issued in another county restraining the state oil inspection department from carrying out its duties, opened the way to sell oils without the required state inspection. The injunction had been granted on the ground that the inspection law was unconstitutional.

Since then the supreme court held the law to be constitutional and only recently confirmed the verdict of the court at Sheboygan in the Wadhams cases. Following this decision, the Wadhams company came into court as convicted and paid fines of $25 on twenty-five counts and $5 on the twenty-sixth, making a total of $1,005 paid in fines.

In another case at Milwaukee, the Wadhams company's conviction also was made to stand, and the company was fined $5 and the costs, which amounted to a large sum.

The Sheboygan and Milwaukee convictions and affirmation seem to establish the right of the state of Wisconsin to inspect all petroleum products sold in Wisconsin.

The common council of Oshkosh, Wis., has adopted an amendment to the ordinance restricting the storage of petroleum products, saying: "* * * * within the special fire limits of the city of Oshkosh not to exceed twenty barrels of kerosene, carbon oil, or lubricating oil may be stored at any one time." The amendment was passed in spite of the strenuous objections of the big oil companies, as well as jobbers and retailers in petrol products in this section of the state.

Routes and Information

From Chicago, Ill. to Indianapolis, Ind.

THE Indianapolis 500-mile speedway race is just 2 weeks distant, and as many motorists in Chicago and vicinity contemplate making the run to Indianapolis, the accompanying map and directions will help out considerably. Every Chicago motorist is familiar with the park circuit and the exit from Jackson park at Jeffery avenue to Eighty-third street, east to Baltimore and onto Commercial avenue as far as Ninety-second street, and over the bridge to Ewing avenue, going under the viaduct at One Hundredth street at South Chicago. Here follow Indianapolis avenue through Whiting and the trolley to East Chicago. Pass through the town and at Koscuisko park turn left. At Grasselli station cross the railroad; go south on direct road over railroad and bridge to Gibson, 23 miles; cross two railroads and continue south to Hessville, 25 miles.

Cross railroad and keep straight ahead to Highlands; follow direct road south, crossing three railroads, curving gradually left into Schererville, where turn left into road from Dyer.

Go east 1 mile and turn south, cross railroad, meet road from St. Johns and jog left then right 1 mile, left 2 miles, right ½ mile and east into Crown Point, 43 miles.

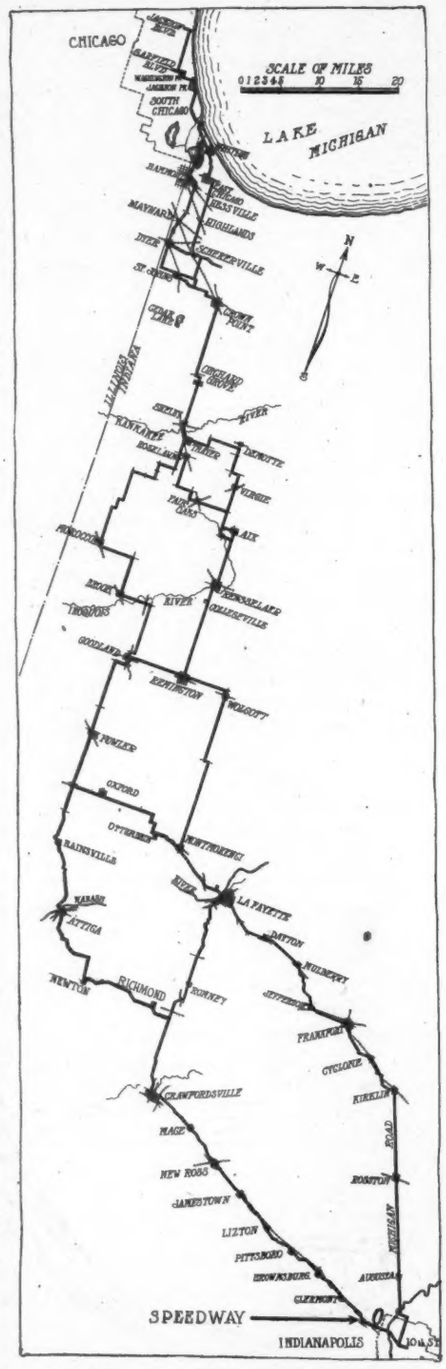
Follow Joliet street to edge of town and south along eastern leg of the Cobe cup race course to end of road; ½ mile east to Orchard Grove; go south, passing Shelby; cross long wooden bridge and follow main traveled road to Thayer, 19 miles from Crown Point.

Continue south, crossing railroad to first four corners and turn left to Roselawn; here turn right, leaving railroad and go south 8 miles on main road into Fair Oaks; go east 7½ miles, crossing railroads; south 2 miles and east 1½ miles to Aix; cross bridge and follow road with slight turns, go left, cross railroad and enter Rensselaer on Main street, about 25 miles distant from Thayer.

Follow Main street, crossing bridge; and main traveled road south 12 miles to northern edge of Remington.

Turn square left 6 miles to edge of Wolcott, then right through town, crossing railroad; go 8 miles south and curve left with road to first right-hand road; turn south through all four corners and travel over 11 miles to Montmorenci. Jog left and right, keeping left at church in fork.

Follow direct road, using caution for railroad crossing. Pass Purdue university, entering city; follow trolley on Main street over bridge to Lafayette, 133 miles.



VARIOUS ROUTES TO THE BIG RACE

Keep ahead with trolley on Main street, gradually curving right upgrade; follow trolley to Dayton.

Keep to main road in five corners to Mulberry, where bear diagonally left on middle street, cross railroads; cross stone culvert, follow direct road to Jefferson and Clinton streets, and take left road to Frankfort, 24½ miles from Lafayette. At courthouse turn right on Jackson street to Alhambra street, where bear left past fair grounds, cross railroad and continue with main travel to Cyclone.

Turn right 1 mile to four corners and turn left then next right with main travel and follow telephone poles, crossing bridge and keeping to left to end of road; jog right and left to Kirklin, 12 miles from Frankfort.

Turn right on Michigan road for 12 miles through Rosston, cross two stone bridges to Augusta; follow same road, cross bridge, pass country club and cemetery at Tenth street; go east to Indiana avenue, then on out to the speedway. This makes an approximate distance of about 202 miles.

It will be noticed that a trifle different route out of Chicago to Crown Point and also from Thayer to Rensselaer has been outlined. This first change was made on the advice of J. P. Dods, of the Automobile Blue Book Publishing Co., and it is expected that the bulk of the travel for 1912 will be turned over that course. The second diversion from the regular route was recommended by N. C. Shafer, of Rensselaer, and avoids some bad sand on the Virgie road.

Should the motorists wish to avoid the crowded thoroughfare of Indianapolis in getting to the speedway, a road which is fine gravel all the way can be followed from Lafayette out Second street, Wabash avenue and under railroad; jog right at end of road, cross four bridges before reaching Romney, 12½ miles from Lafayette.

Continue through, crossing bridge; and at fork bear right beyond intersect road and crossing railroad; turn left at end of road; cross bridge; continue to covered bridge; to Market street, to Main street and Crawfordsville, 15½ miles from Romney. Turn left around courthouse and follow main travel road direct through New Ross, Jamestown, Lizton, Pittsboro, Brownsburg, Clermont and on to speedway. Crawfordsville to Indianapolis is 46 miles.

Another decided option which is advocated by George Ade leaves Thayer on the road going straight south instead of making the turn east for Roselawn. This south road is followed to the drainage ditch which is crossed and a west turn made, taking the road lead-

T. C. A. Departments

COINCIDENT with the opening of the touring season this year comes the announcement from the Touring Club of America, Broadway at Seventy-sixth street, New York, that in addition to the seventeen departments and branches established by the club in the eastern and middle western states last year, seven new touring bureaus have been opened. The Club is now represented in the following cities:

Utica, N. Y.....Arcade Bldg.
Cooperstown, N. Y.....The O-te-sa-ga
Newburgh, N. Y.....The Palatine
New Haven, Conn.....Hotel Taft
Delaware Water Gap, Pa.The Kittatinny
Louisville, Ky..Hotel Henry Watterson
St. Regis, Mont., Can.....
.....Eastern Canadian Headquarters
Boston, Mass.....Hotel Lennox
Bretton Woods, N. H..Mt. Washington
Waterbury, Conn.....Elton
Pittsfield, Mass.....Wendell
Springfield, Mass.....Kimball
Albany, N. Y.....Onondaga
Rochester, N. Y.....Hotel Seneca
Washington, D. C.....Colorado Bldg.
Baltimore, Md.....Hotel Emerson
Chicago .....Karpen Building
Atlanta, Ga.....Georgian Terrace
Augusta, Ga.....The Albion
Savannah, Ga.....DeSoto
Chattanooga, Tenn.....Hotel Patten
Nashville, Tenn.....Hotel Hermitage
Jacksonville, Fla.....Hotel Hermitage

Headquarters have been secured with motor clubs in Rochester, N. Y.; Syracuse, N. Y.; Albany, N. Y.; Newburgh, N. Y.; Waterbury, Conn.; Pittsfield, Mass., and Louisville, Ky.

An Iowa Mystery

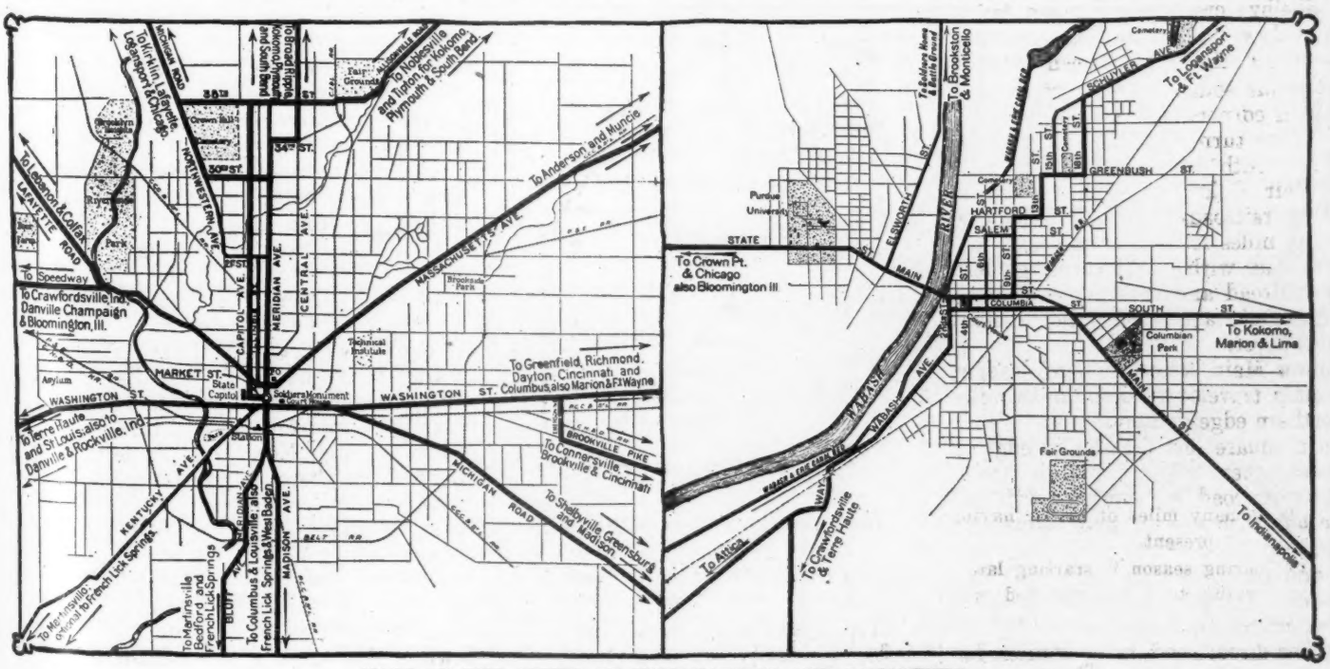
THE United States contains more and older curiosities than the whole of Europe and Asia combined and one of the wonders seen on the 45,000-mile trip of the Abbott-Detroit Bull Dog, reported by Dr. Charles G. Percival, is the walled lake about 100 miles west of Dubuque, Ia. This lake occupies about 2,800 acres and is about 3 feet higher than the earth's surface. Around it is a wall about 10 feet high and 15 feet wide at the base and 5 at the top. The stones that compose it weigh from 100 pounds to 3 tons and yet there are no stones in the neighborhood of the lake for 5 or 10 miles and no one has any idea how these stones could have been brought to the place or who constructed the lake. Around the entire lake is a heavy growth of oak ½ mile in depth and yet no trees of any kind grow within many miles, as the entire country is a rolling prairie. In 1856 a great storm arose and the ice on the lake broke down the walls, flooding the farms in the vicinity, as the water is 26 feet deep, necessitating repairs to the wall. The soil at the bottom of the lake is sandy and the water clear and cold. No one knows where it comes from or goes and yet it always is fresh and clear.

ing across the fields parallel with the big ditch. This is a short cut to the stone road. After turning west look out for two bridges close together. Go 1 mile west and you skirt the edge of a knoll with oak trees, cross a bridge onto the stone road and are headed west. After following the stone road for over 4 miles you reach cross roads and take the left stone road following the telephone line. Go 1¾ miles south and ½ mile west. Keep to the stone road. Just after the ½ mile turn west; you will notice a prominent sand hill covered with trees. This is Bogus island, formerly headquarters for a notorious gang of horse thieves and counterfeiters.

After turning south from the ½ mile jog, follow stone road 1 mile to end of road, then turn right, west and cross the tracks near Enos station. Continue ¼ mile west to first road leading south, follow it and go 5 miles into Morocco. Continue south through the town, crossing tracks and take first stone road leading east. Cross two railroads and go 2 miles to corner, where the wind pump can be seen. Follow stone road south and go 1 mile to end of it. Turn east before reaching schoolhouse.

Go east for 1½ mile over stone road and 1 mile farther on dirt and gravel. Pass schoolhouse, continue to cross roads and turn right 1 mile. Jog right and south to Brook. Go through town, passing McKinley park and Hazelden. Continue through Foresman, crossing railroad tracks, and take first road leading south 7 miles into Goodland.

Continue south through Goodland to end of road; turn west, jog across railroad tracks, follow main stone road 3 miles. Turn west and go 2 miles to stone road leading south 7 miles into Fowler. Go through Fowler and straight south for 6 miles across Lake Erie tracks; and continue south to Rainsville and Attica; follow main road to Newton, New Richmond, crossing railroad and on east to cross road, the south fork of which is the main road leading into Crawfordsville. The road is easy to follow into Indianapolis.



MAPS OF THE CITIES OF INDIANAPOLIS AND LAFAYETTE

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Information on Roads Used by Tourists

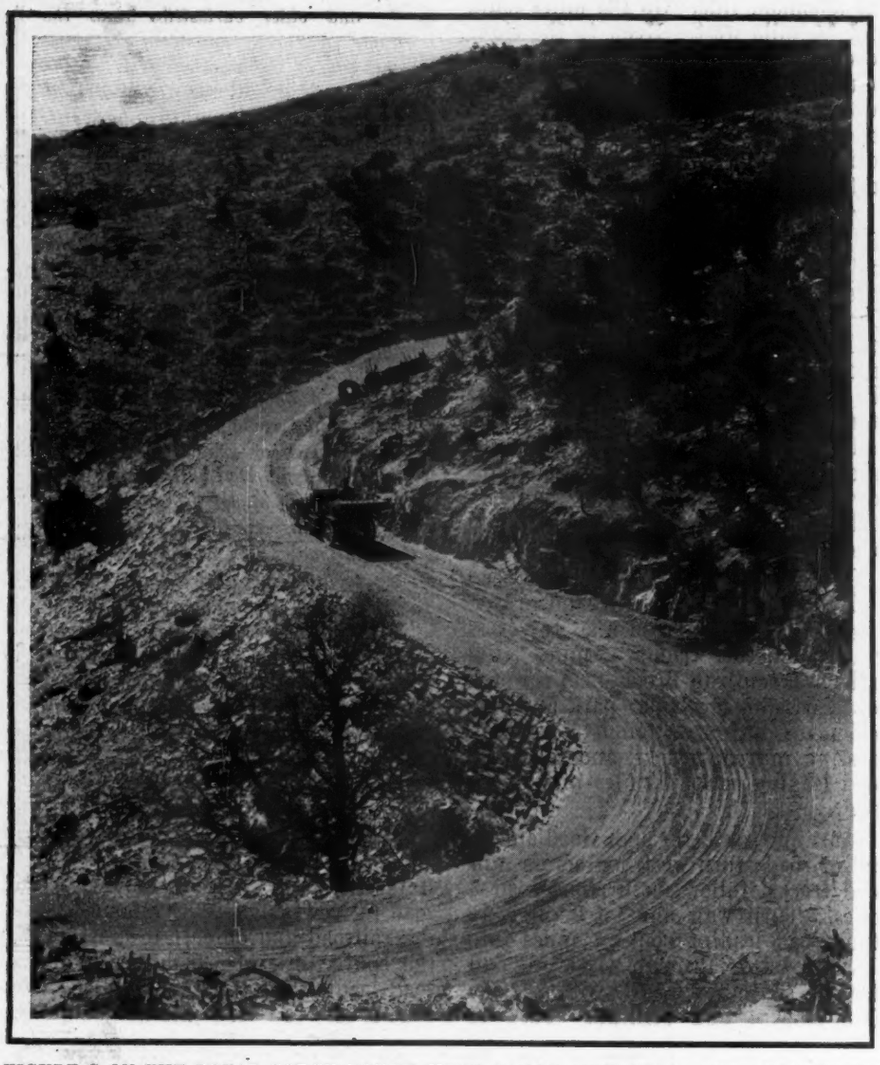


FIGURE S ON THE ROYAL GORGE ROUTE, NEAR CANON CITY, COLO. EASY GRADES ON ALL ROADS IN THIS SECTION

THE road from Tampa, Fla., to Jacksonville via Brooksville and Ocala is in fine shape with the exception of a stretch from St. Augustine to Daytona. From Tampa to Ormond beach the road is in unusually good condition.

The Cayuga lake ferry, used largely by through tourists going west through New York state via Auburn to Rochester, is ready, a full week before expectations. Owing to complaints of motorists last year, two boats will be employed this season instead of one, so there will be no delays. Meanwhile, there is being constructed through the swamps near Free Bridge a new state road, after much difficulty in securing a firm foundation, that will save many miles of detour having to be made at present.

The touring season is starting late this season, owing to the protracted winter. The Automobile Club of Syracuse plans to have a more successful system of routing information than ever. The club gains it in this way. From twenty to fifty parties daily call at the offices while passing through Syracuse. From them the latest information is obtained in regard to roads, and they are given a stamped envelope addressed to the club in which they are asked to enclose the latest points in routes they still have to traverse. In this way information is kept up to date, and it is particularly serviceable in cases where a state gang descends suddenly upon a road to tear it up.

From the eastern representative of the Touring Club of America comes their first bulletin of the season. Springfield, Mass., to the top of Jacob's Ladder is in as good condition as any time during the summer. From the top of Jacob's Ladder to East Lee the road is bad. Up to recently, the road was frozen and full of holes and ruts. In some places on the western slope of the ladder, the whole surface is broken, and there seems to be a brook running under the crust. On a soft day now this whole section would be almost impassable. From East Lee to Pittsfield the road seems to be in fine condition.

From Baltimore, Md., the road to Washington is in very fine shape. A run can be made to Hagerstown over a road which is in condition.

In the neighborhood of Joliet, Ill., a motor car can not travel 5 miles out of the city before getting stuck in mud above the wheel hubs. In 2 or 3 weeks the roads ought to be pretty fair.

From the Glasgow Commercial Club, Glasgow, Mo., comes a statement that all their roads are in good condition and are being dragged as rapidly as possible.

The Interstate trail in Missouri between St. Joseph, Mo. and Kansas City, Mo., has been completely marked through Dearborn, Edgerton, Trimble and Smithville entering Kansas City over the Swift-Armour-Burlington bridge. The mileage is 63

California reports on road conditions have it that the road out of Sausalito en route for Cloverdale is bad with the only good stretch as far as Kentfield. On reaching the foot of the Alta grade the turn to the right should be taken, as the road by way of Greenbrae is deep with blue shale that has lately been applied to improve the road surface. The road from Kentfield to within a few miles of Petaluma is fairly good. From Petaluma to Santa Rosa it is rough. The highway improves to Healdsburg. A lot of work is being done on this stretch and it will be in fine condition shortly. From Healdsburg to Cloverdale the roads are in splendid condition.

The Automobile Club of Seattle, Wash., has issued its second road bulletin of the season. The King county ferry has been laid up for repairs, and a new schedule arranging for more frequent trips will soon be put in operation. In going to Tacoma, do not follow any part of the Pacific highway south of Kent. From Kent to North Puyallup it is closed.

PENETRATING IOWA

Sherburn, Minn.—Editor Motor Age—What is the best route from Kewanee, Ill., to Estherville, Ia.—E. Barlow.

Motor to Cambridge, Geneseo, Briarbluff, Moline, cross on iron bridge to Davenport. Proceed to Maysville, New Liberty, Bennett, Clarence, Mechanicsville, Lisbon, Mt. Vernon, Marion, Cedar Rapids, Belle Plaine, Chelsea, Tama, Montour, Butlerville, LeGrand, Marshalltown, State Center, Colo, Nevada, Ames, Boone, Stanhope, Webster City, Fort Dodge, Dakota City, Humboldt, St. Joseph, Algona, Emmetsburg, Graettinger and Estherville. In dry weather the roads are good dirt, but in wet weather you will find them almost impassable, according to the Blue Book.

Columbus, O., to Tampa, Fla., Outlined

COLUMBUS, O.—Editor Motor Age.—Please give the best route from Columbus to Tampa, Fla.—G. A. Shields.

A map of this trip, as far as Jacksonville, Fla., is given in the March 28 issue of Motor Age, page 16. It probably will seem that the route Motor Age is going to outline is too long and that there must be a shorter one. The Blue Book people advise the tourist to allot a little more time to the trip, travel over better roads, see this wonderful scenic and historic country, and above all things do it leisurely. The roads are not a perfect boulevard all the way—it cannot be expected—but they are an improvement over those which you will encounter by routing over the short line.

Headed eastward on the National highway your route lies through Granville, Newark, Hanover, Nashport, Irville, Zanesville, Bridgeville, Norwich, New Concord, Cambridge, Washington, Elizabethtown, Fairview, Hendrysburg, Morristown, Lloydsville, St. Clairsville, Bridgeport, Wheeling, West Alexander, Claysville and Washington.

Between Cambridge and Wheeling there is a toll road most of the way, beyond that point you will encounter a hill road with many turns, patches of macadam; but most of the way either fair country road or worn pike. This is not a good road for rainy weather, but good time can usually be made in settled weather. From Washington traveling towards the coast go through Beallsville, Brownsville, Uniontown, Somerfield, Keyser's Ridge, Grantsville, Cumberland, Bedford, McConnellsburg, Chambersburg, Hagerstown.

The New York-Atlanta highway is traversed now through Tilghmantown, Battlefield of Antietam, Sharpsburg, Shepherdstown, Halltown, Charlestown, Berryville and Winchester. A trifle shorter route from Hagerstown lies through Williamsport, Martinsburg, Clarksville, Bunker Hill, Winchester, clear through Stephen City, Middletown, Strassburg, Maurertown, Woodstock, Edinburg, Mount Jackson, New Market, Lacey Springs, Harrisonburg, Mount Crawford, Burkstown, Verona, Staunton, Minte Springs, Breenville, Midway, Fairfield, Lexington, Fancy Hill, Natural Bridge, Buchanan, Troutville, Cloverdale, Roanoke.

From Roanoke to Winston-Salem you pass through Rocky Mount, Snydorville, Oak Level, Martinsville, Ridgeway, Stoneville, Madison, Ellisboro, Stokesboro, Kernersville and Centerville. You will have to ford many small streams, the first part being very hilly, with deep grades. The itinerary from Winston-Salem to Atlanta is as follows: Summerfield, Guilford Battlegrounds, Greensboro, Jamestown, High Point, Thomasville, Lexington, Spencer, Salisbury, China Grove, Kanapolis, Concord, Newell, Charlotte, Sloane's Ferry, Belmont, Lowell, Gastonia, Bessemer City, King's Mountain, Grover, N. C., Blacksburg, S. C., Gafney, Converse, Spartanburg, Duncan, Greer, Greenville, Oak Grove, Piedmont, Anderson, Lavonia, Canon, Royston, Franklin, Commerce, Winder, Auburn, Lawrenceville, Snellville, Stone Mountain, Scottdale and Decatur.

Atlanta to Macon—Jonesboro, Lovejoy, Hampton, Pomona, Griffin, Milner, Barnesville, Forsyth, Smarrs, Bolingbroke, Loraine; Macon to Jacksonville—Hawkinsville, Abbeville, Fitzgerald, Douglas, Waycross and Callahan.

Should you desire to motor to Savannah and thence along the coast to Jacksonville from Macon, go through Milledgeville, Sandersville, Davisboro, Louisville, Waynesboro, Perkin, Millen, Scarboro, Rockyford, Statesboro, Stilson, Savannah, Riceboro, Eulonia, Darien, Brunswick, Old Sterling, Tarboro, Owens Ferry, Kings Ferry and Callahan. At Darien you can secure a Darien-Dents landing ferry for $5; at Owens and Kings Ferry the charges are $1

Go over the main-traveled coast route between Jacksonville and Tampa, through St. Augustine, Moultrie, Ormond, Daytona, Orange, Enterprise, Osteen, Sanford, Longwood, Maitland, Orlando, Pine Castle, Kissimee, Campbell, Loughman, Haines City, Eagle Lake, Bartow, Lakeland, Plant City, Dover, Seffner, Mango, Tampa. If you do not care to take the coast route to Tampa, then you might go to Highland, Lawtey, Starke, Hampton, Waldo, Fairbanks, Gainesville, Evanston, McIntosh, Ocala, Dunnellon, Irverness, Brooksville; thence to Trilby, Dade City, Greer, Knights, Plant City, Dover, Seffner, Mango and Tampa.

For the shorter route from Columbus, you would pass through Circleville, Washington Court House, Cincinnati, Louisville, Ky., Bowling Green, Nashville, Tenn.; Murfreesboro and Chattanooga, to Atlanta, Ga.

Regulations Governing Motorists in Glacier Park

RULES governing the use of motor cars in Glacier park in Montana have been framed by the secretary of the interior at Washington, D. C. The regulations are as follows:

No motor car will be permitted within the metes and bounds of the Glacier national park unless the owner thereof secures a written permit from the superintendent or his representative.

Applications for permits must show: a, name of owner; b, number of machine; c, name of driver, and d, inclusive dates for which permit is desired, not exceeding 1 year, and be accompanied by a fee of $1 for a single round trip through the park, or a fee of $5 for each machine per annum.

Permits must be presented to the superintendent or his authorized representative at the park entrance on the government road. The permittee will not be allowed to do a transportation business in the park without special license therefor from the secretary of the interior.

The use of motor cars will be permitted on the government road from Belton, Mont., to the administrative headquarters at Lake McDonald between the hours of 7 a. m. and 8:30, provided sufficient room is left on the inside for horses to pass.

Motor cars will stop when teams, saddle horses, or pack trains approach, and remain at rest until they have passed or until the drivers are satisfied regarding the safety of their horses.

Speed will be limited to 6 miles per hour, except on straight stretches where approaching teams, saddle horses and pack trains will be visible, when, if none in sight, this speed may be increased to the rate indicated on signboards along the road; in no event, however, shall it exceed 15 miles per hour.

Signal with horn will be given at or near every bend to announce to approaching drivers the proximity of a machine.

Horses have the right of way and motor cars will be backed or otherwise handled, as necessary so as to enable horses to pass with safety.

All permits granted at any time when motor cars can enter the park will expire on December 31 of the year of issue.

Violation of any of the foregoing rules, or the general regulations for the government of the park, will cause the revocation of permit; will subject the owner of the motor car or motor cycle to any damages occasioned thereby and to ejectment from the reservation, and be cause for refusal to issue a new permit to the owner without prior sanction in writing from the secretary of the interior.

SCENE AT BROOK, IND., NOT FAR FROM GEORGE ADE'S FARM, HAZELDEN

Vibrator Contact Points

Proper Dressing Down of Platinum Button Necessary for Best Operation

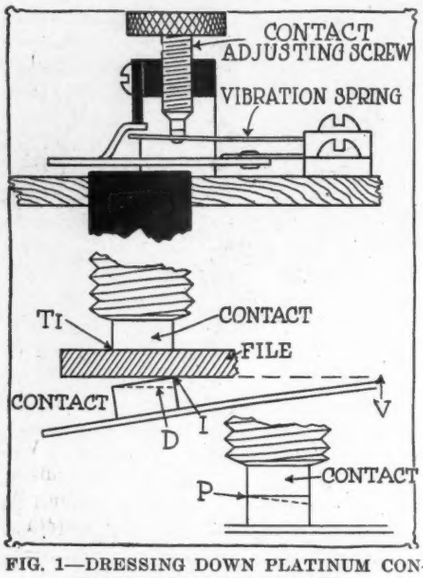


FIG. 1—DRESSING DOWN PLATINUM CONTACT POINTS OF VIBRATOR

OELWIN, IA.—Editor Motor Age—I have a 1908 model 10 Buick. The vibrators stick when polished, and smooth contact points seem to stick, or not make contact in a few minutes. It has bothered for months and seems to be getting worse and worse. Kindly advise what the trouble may be.—A Motorist.

Your description of your trouble seems to indicate that the contact points are not properly adjusted. Since you state that the sticking takes place when the contacts are polished and smooth, it is probable that the contact surfaces are not parallel. This is a common cause of vibrator trouble. Motorists often make the error of dressing down the platinum points of a coil by working a comparatively thick file back and forth between them, with one contact point bearing against the one side of the file while the other bears against the other side of the file. This brings about the results indicated at P in Fig. 1.

As the vibrator blade is pivoted, so to speak, at V, when it is sprung down so that the file may be inserted between the point on it and the point on the contact screw, the two contact surfaces will not bear evenly upon the opposite sides of the file. Thus if the file is held parallel with the upper surface, the surface of the lower point will be dressed down as indicated by the dotted line D. The result is shown in the lower illustration. There is only a very small point of contact at the point P, and perhaps, it permits so little of the current to flow, that the timer will have moved off its contact before the core of the coil has been magnetized sufficiently to draw the contact blade down, consequently it continues to remain in touch with the upper contact point and no spark is obtained.

When dressing the points down to remove pits and to clean them, use only a very fine finger-nail file, or fine thin emery cloth; unscrew the contact screw a few turns before applying the file or emery cloth to insure that the surface will remain parallel. When the points are flat, clean and bright, adjust the vibrator spring so that the hammer or piece of iron on the end of the vibrator spring stands normally about 1/16 inch from the end of the core or the coil. Then, adjust the contact screw until it just touches the platinum contact on the vibrator spring. Be sure that it touches, but very lightly. The engine then should be started and if it misses, the screw should be tightened a little at a time until the missing ceases. A bad coil would cause this effect.

The Readers'

Sticking of Interrupter Caused by Improper Filing of Electrodes —Wrist Pin in Top of Piston Inadvisable Location— Wyoming Man Wants Classic Reliability

WRIST PIN LOCATION

Los Angeles, Cal.—Editor Motor Age—What is the reason for locating the wrist pin centrally in the height of the piston and has practice proven this necessary?

2—Does Motor Age know of any successful gas engine wherein the wrist pin is adjacent to the top of the piston? It occurs to me that if the wrist pin were connected to the piston at a much higher point considerable advantage in lightness for the same strength could be gained.—E. M. N.

1—It has been found in practice that the piston pin should be well down the piston. If kept low, the tendency of the piston to knock or cant over when the explosion occurs is very much reduced, but against this, there is the disadvantage that the low position necessitates having a long cylinder. However, the advantages gained by keeping the piston pin low do not, by any means, compensate for the extra height and weight of the engine, so that the gudgeon pin is usually fitted just below the rings, and in this position it gives every satisfaction.

2—No. It should be remembered that, since the piston does the work of a crosshead, it must have sufficient bearing surface to keep the thrust pressure, due to the obliquity of the connecting rod, fairly low; in fact, this should be, if possible, kept at about 10 pounds per square inch, the bearing surface being taken as the diameter of the piston multiplied by its length.

New Glidden Suggested

Westerner Proposes Interesting Routing of Historic Tour to Finish in East

EVANSTON, WYO.—Editor Motor Age—The Glidden tour seems to be on the wane in popularity. As an advertising stunt it is not so effective as formerly, and it must be because of the similarity in the conditions each year. As a pleasure proposition the Glidden tours are not in it, as anyone will admit.

Now, why not have a good big one and one that will arouse interest throughout the country; that is, a tour across the country in Glidden time and under Glidden conditions, running preferably from west to east. The finish then will be in the heart of the population and also the touring conditions will be more difficult, as it is a well-known fact that in this mountain country it is much easier to keep the engine cool and other troubles down when running into the wind than with it, and as our prevailing winds are westerly we find that we boil three times the water in going east as we do in going west. The entire trip could be made in 15 to 18 days, accommodations could be arranged for, and regulations could be provided so that in case of storms the route could be changed to avoid washouts or a day's delay provided for, or a shorter run set. There is no question but when these tourists reached the east in good condition—and there is no doubt but that they could do so—there would be aroused an interest in the tour that has not been in evidence.—P. W. Spaulding.

The American Automobile Association is planning a transcontinental tour in 1915, when the Panama exposition is to be held in California. The tour will run from east to west, though. Because of this proposed contest in 1915, the suggestion that this year's A. A. A. tour be run to the Pacific coast was not considered.

COLD AND THE CAR

Iowa City, Ia.—Editor Motor Age—Does it injure tires to let them freeze?

2—Does running a car in cold weather injure it in any way?

3—Is cold weather hard on the engine?—J. H. Anderson.

1—Not if tires are dry.

2—No. 3—No.

Clearing House

How Cars Are Made Ready for Speed Contests—Many Small Changes Required for Racing—Working of Ford Magneto Explained—Touring License in England

Tuning Up Racers

Method of Getting Light Cars Ready for the Track—Flanders as Example

MARIETTA, O.—Editor Motor Age—I own a three-speed Flanders 20 and would like to know how to get the speed that Witt, the E-M-F race driver, gets out of his car. As I understand it, the cars in stock races must be regular stock cars.

2—Is the timing of the valves or magneto changed?

3—Are the valve springs stiffer?

4—Is the crank shaft heavier?

5—Is there an extra air control added to the carbureter?

6—Is there a needle valve control added to the carbureter?

7—Should an extra air valve be put into the intake manifold above or below the butter-fly throttle valve?

8—Are the piston rings tighter?—W. C. Hagan.

The following information submitted by the Studebaker corporation may assist you in obtaining the speed you desire:

1-A—Run car thoroughly till well loosened up.

B—Set seat low as possible and rake steering post to conform, bracing solidly at dash.

C—Remove muffler, run exhausts through holes in hood, if you care to.

D—Remove the fan and belt. You will not need them at high speeds.

E—Remove all piston rings but the top one.

F—Advance timing one notch of the gears.

G—Keep magneto points set very close.

H—Adjust valves so they give a clearance of 1-64 inch.

I—Remove the slots in the carbureter. you will have to cut them out with a saw. Give the carbureter all the air it will take.

J—Weight down front and rear springs and strap them there.

K—See that your front wheels are free and that your brakes do not drag.

L—Keep your car as light as possible.

M—If you have to make tire changes, use extra wheels.

N—Be free with lubricating oil. Let a quart or so down into the crankcase before starting a race. Fill your reservoir and leave the plug a bit loose, in order that there may be a continuous flow of oil during the race. You will learn to adjust this by experience.

O—If you race more than 10 miles, fit an auxiliary oil tank, worked by pump to reservoir.

P—Use about ½ gallon of thin oil in transmission.

Q—Use castor oil for motor lubrication, if you can stand the smell.

R—Use gasoline of 74 test or lower.

S—Inflate tires to 65 pounds pressure for speed work.

T—See that your steering gear connections are in perfect condition.

2—Answered above at F.

3-4-5-6-7-8—No.

TOURING LICENSE IN ENGLAND

Middleville, Mich.—Editor Motor Age—I would like information as to shipping a car from this country to England as to the taxes, duty, also what publication for England and Scotland would take the place of the Blue Book. I would like as complete information as possible.—R. F. French.

In the issue of March 21 you will find a lead story on "Shipping the Car to the Continent." You will find this article very valuable. No duty is required in England, simply a license, the cost of which is $10.00. Good publications for England and Scotland which will take the place of the Blue Book are Bartholomew's Map of the British Isles and The Car, both of which may be obtained from the Touring Club of America, New York; the former costing $1.50 and the latter $5. The Homeland Reference Book, published by Frederick Warne & Co., New York; and Burrow's R. A. C. Handbooks, published by Edward J. Burrow, Cheltenham, Eng., and New York. At an extra expense of $10 you can join the Touring Club of America, which also includes membership in the the Touring Club of France, and will secure the very best of service. The Touring Club of America has special arrangements for the shipping of members' cars and upon receipt of details will furnish a quotation. The club also can secure the license for England in advance, if it is so desired. The American Express Co. will take your car and attend to all details of crating, shipping, licensing, etc., and deliver it to you at any of its European offices.

Operation of Magneto

How Electric Generator in Flywheel Produces Spark—Adjustment of Ford Gearset

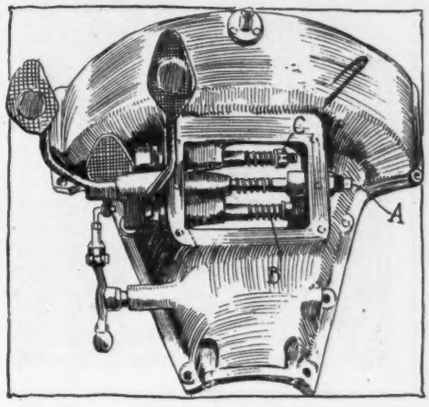


FIG. 2—ADJUSTMENT OF FORD BRAKES AND PLANETARY GEARSET

KOKOMO, IND.—Editor Motor Age—How does the Ford flywheel magneto generate the current?

2—How are the magnets arranged?

3—How is the model T planetary transmission adjusted?

4—How are the Ford brakes adjusted?

5—How is the multiple-disk clutch of a Hupmobile tightened?—A Reader.

1—The flywheel magneto of the Ford car is a low-tension magneto of the inductor type, that is, it has a stationary armature consisting of a number of coils which are attached to the cylinder casting and a set of permanent field magnets of the horseshoe type which are secured to the flywheel, the whole being incorporated in and a part of the motor. The magnets revolve with the flywheel at a distance of 1-32 inch from the coils which collect the current from the magnetic field and shunt it into the spark coil where it is transformed from low-tension to high-tension current and sent to the spark plug to perform its function of igniting the charge. The generation of the current is just the same in principle as that of the ordinary magneto, the only difference being that in the Ford magneto the armature is stationary while the fields revolve and in the ordinary magneto the fields are stationary and the armature revolves. The effect is just the same. The generation of current in a magneto was explained in this department of Motor Age for April 25.

2—The south poles are placed together.

3—To adjust the transmission on the Ford car, take off the cover on top of the transmission case and run the clutch band adjusting nuts B and C. Fig. 2, to the extreme ends of the brake and pedal shafts; then remove the slow-speed band adjusting screw A; loosen bolts holding transmission cover; take hold of slow-speed pedal and lift off the cover assembly. Slip the bands forward, sliding the

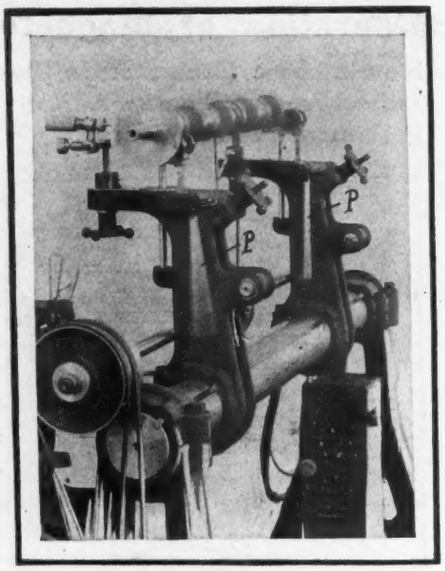


FIG. 3—CRANKSHAFT OUT OF BALANCE

one nearest the flywheel over the first of the triple gears; turn the bands so that the ears are down, then pull them out. To do this requires the spreading apart of the band at the ears, and is more easily accomplished if the three sets of triple gears are so placed that one set is about 10 degrees to the right of the center at top. To replace, reverse this procedure, and when fitting the transmission cover see that the clutch release ring rests into the rear groove of the clutch shaft.

4—To tighten the brake and reverse bands remove the transmission case cover, and turn the adjusting nuts B and C, Fig. 2, on the shafts to the right. See that the bands do not drag on the drums when disengaged, as they exert a brake effect, and tend to overheat the motor. The bands, when worn to such an extent that they will not take hold properly, should be relined with raybestos material, so that they will engage smoothly without causing a jerky movement of the car.

5—In the late models of the Hupmobile there are three set screws or plugs by which the clutch can be tightened. With the earlier models it is necessary to disassemble the clutch and put in a new spring.

SELF-STARTER FOR FORD

Fort Riley, Kan.—Editor Motor Age—1—I have a Ford model T, 1911, equipped with electric lights. What self-starter can be installed with greatest satisfaction to me?

2—What will cause my car on dry macadamized roads to have a tendency to skid to the left? Is it that the torsion tubes on that side are out of adjustment?

3—The left side of my cylinder seems to sweat oil. Is this due to the fact that the cylinder head is loose and needs a new gasket?

4—At a speed of 20 miles there seems to be a slight, dull bump somewhere, quite different from the metallic knock when the spark is too far advanced when hill-climbing. Otherwise the car is most satisfactory. What is the reason?

5—Should all bolts in the universal joint be tight and permit no play, or should there be a slight play to torsion tubes?

1—Motor Age refers you to the advertising columns for information regarding self-starters, and would advise that you

Balancing Methods Employed in Plants

Rotating Parts Such as Crankshafts and Flywheels Now Balanced While in Action and Pistons Are Weighed

WICHITA, KAS.—Editor Motor Age—Please describe the method of balancing motors used in factories.—Val Cole.

In the Moline motor car factory all rotating parts in the car are balanced by means of specially-adapted balancing machines, in order to get a perfect running balance. The old methods of balancing weights would give only a static balance, that is, the rotating parts could be balanced perfectly standing still, but still they were not always in balance when running. All rotating parts of high speed machinery should be running balanced. A part in running balance will also be in standing balance. Exact symmetry of form is no guarantee of running balance. High-speed parts should be so designed and balanced that they will not distort from centrifugal action if rotated free at any speed at which they may run in use, and thus destroy a state of running balance.

In Fig. 4 is shown a standing balancing machine with a crankshaft mounted upon it. It comprises two absolutely horizontal rails, upon which the shaft to be balanced is rested. A shaft in perfect standing balance is required to remain stationary at any position into which it is rolled. If a shaft is out of balance, when a slight rolling momentum is imparted to it, it will tend to rock back and forth upon the rails until it comes to rest with the heaviest portion downwards.

In Fig. 6 is shown a Norton running balance machine with a six-cylinder motor crankshaft mounted upon it. The shaft rests at three points upon small roller carriers or cradles, which in turn are mounted upon vertical rods. These rods run through rubber disks which permit them to vibrate to a certain limited extent. Pointers P, or index fingers are connected to the supporting rods so as to vibrate with them and to magnify the vibration to the eye. The supporting cradles are provided with means of adjustment whereby the shaft can be leveled and the driving belt tightened.

The electric motor is arranged for driving at various speeds, so that the shaft can be run at whatever speed is necessary for the work in hand. The method of using the machine is, roughly, as follows: The shaft to be balanced is put on the machine and the controller of the electric motor is used to vary the speed of the shaft till the pointers vibrate at their maximum. Having arrived at this stage there is no doubt about the shaft being out of balance, and the next point to consider is how the vibrations shown by the pointers may be located, as these vibrations are due to some inequality or inequalities in the weights of the different parts of the shaft.

Attached to the carriers are some small scribers. These are adjusted one by one, and when the scriber marks the shaft an indication of the locality of the cause of disturbance is given. Previous to using the scriber the shafts may be painted if desired, so that the marking of the scriber shall be more easily visible. When the scriber has marked the shaft, the direction of rotation of the latter is reversed, and another marking made, as the inequality will be, roughly speaking, between the two markings. To correct the inequality it will be necessary to grind something off or add weight as the case may be.

Figs. 3 and 6 show a crankshaft in process of being tested for balance. In Fig. 3 the shaft has been put into the machine actually unbalanced, though perfectly finished and in good standing balance. It may be seen, however, that both of the pointers P are vibrating violently, the nearer one of the two being the worse. In Fig. 6 the test is made after the shaft has been balanced; and it will be noticed that both pointers have come to rest.

On the same principle may the flywheel, the fan, the clutch, the wheels, or any other rotating part be balanced, though

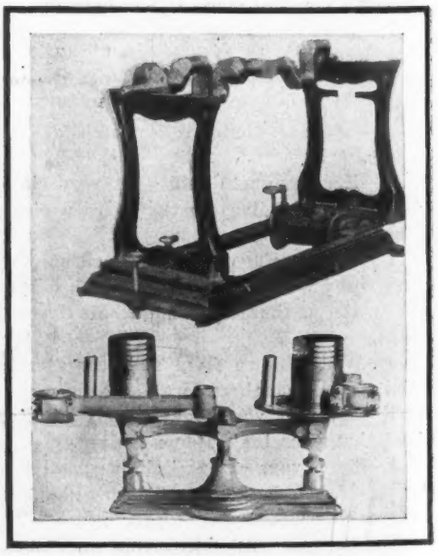


FIG. 4—STANDING BALANCE MACHINE—BALANCING PISTONS, RODS, ETC.

Maintaining Equilibrium in Engines

Difference Between Running and Standing Balance Explained —Special Machines—Clutches and Wheels Considered

the methods of procedure may be different in each case. For balancing flywheels, for instance, the Defiance motor flywheel balancing machine is widely used. As illustrated, it comprises a frame of conical form, in the center of which is placed a vertical ground steel spindle standing in a step bearing in the base of the frame, and passing up through a long bearing at the top of the frame. This spindle at its upper end carries a face plate provided with two driving pins, which project upward parallel to the axis of the spindle. A steel center with taper shank is fitted into the vertical spindle. Its upper end is reduced to a conical point, and upon this rests the object to be balanced.

The vertical spindle is rotated by friction gearing driven by a horizontal shaft in suitable bearings at the base of the machine. This horizontal shaft is in two pieces, and they are connected by a friction clutch and moved longitudinally by a counter-weighted lever so arranged that the weight may be used to press the clutches together when it is desired to rotate the object to be balanced, and to disconnect the clutches when it is desired to examine, test, and mark the object while running alone, as the driving pins are liable when pressing against the object to be balanced to produce uneven rotation. The true unbalanced condition is best shown when the disturbing influences of the motive power are withdrawn after the clutch is released.

Fig. 5 represents a six-arm flywheel poised and driven as described. Before rotating, locate near the center of the interior of the rim a weight of the size necessary to produce a standing balance, then rotate and mark upon the edge of the rim with a pencil of moistened clay. If the mark occurs within one-fourth of the circumference of the wheel from the weight, in the direction of rotation, raise the weight and at the same time advance it toward the mark. If the mark occurs at more than one-fourth the circumference from the weight, depress the weight and retreat from the mark. If, by these steps, the edge of the wheel be reached and the wheel runs out, increase the weight and place a counter-weight diametrically and transversely opposite, so that the relative position of the two weights will be as are those of A and B. Care must be taken, at every adjustment of the weights, that a standing balance be not violated.

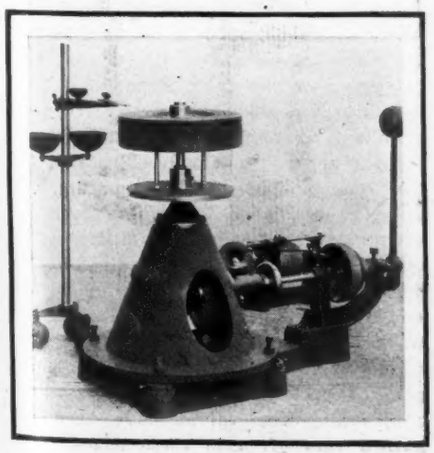


FIG. 5—BALANCING MACHINE TO GET RUNNING BALANCE FLYWHEELS

If, upon the readjustment of the first weight, the mark occurs at one-fourth of the circumference of the wheel from the weight, nothing more can be done with such weight, but an additional weight must be placed at the mark, and, if this disturbs the standing balance, locate a counter-weight, as in the first described condition.

In a case in which it is not permissible to attach weights, but in which excess of material must be cut away, it is obvious than an inversion of the above reasoning must often be pursuel, and frequently the use of trial weights facilitates the solution.

All reciprocating parts, such as pistons and connecting rods, have to be balanced separately on balancing scales, which is equivalent to a simple weighing method. Another balancing operation of a motor car engine, which is of great importance, is the balancing of the compression in the different cylinders, due to the slight variation in the cylinder casting. The compression will vary, which must be tested by means of an accurate compression indicator. Small variations can be rectified in most cases with the valve caps, which may be made to extend into the cylinders more or less. It also must be borne in mind that other rotating parts on a motor car, such as the clutch and wheels, for instance, must balance. The balancing of wheels is particularly important in racing cars, as unbalanced wheels would at high speeds promote skidding, as the heavier portion would tend to lift the wheels off the ground for a portion of each revolution, and traction also would be lost, to say nothing of the damage to the tires.

write the makers of the acetylene and mechanical and compressed-air devices and get their views on the respective merits of their products as applied to the Ford car. It must be borne in mind that the Ford car has a planetary transmission mechanism, which requires a comparatively large amount of energy to crank the motor when cold.

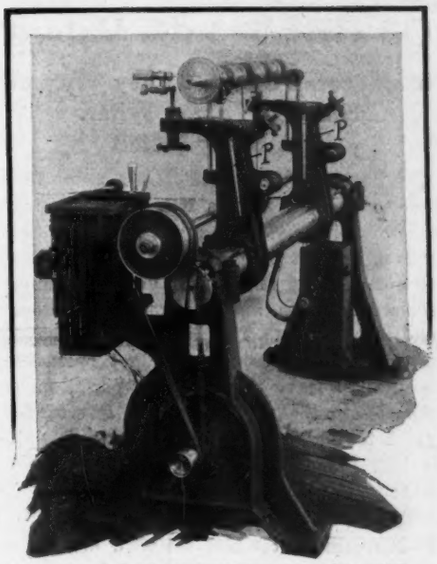


FIG. 6—CRANKSHAFT IN BALANCE

2—No, it hardly is possible that the skidding is due to improperly adjusted torsion rods, as they are capable of hardly more than 1-16 inch of adjustment. Your trouble is more likely to be due to maladjustment of the front wheels; perhaps, one of the front wheels may be converging in more at the bottom than the other, so that it tends to push the front end of the car sidewise and thus gives the impression that the rear end of the car is skidding in the opposite direction.

3—The sweating of oil is quite harmless, and is not due to a leaky gasket, but rather to an oil-soaked gasket, out of which oil is squeezed when the motor warms up.

4—The dull thump that occurs at about 20 miles an hour apparently is due to misfiring or a weak explosion in one of the motor cylinders at this speed. It may be due to a weak exhaust valve spring that does not close the exhaust valve quickly enough or hold it tightly closed during the suction stroke; or it may be caused by a poorly adjusted spark-coil vibrator.

5—There should be no play in the universal points of the torsion tubes. If it exists, it should be removed by tightening the nuts or fitting new ball-ends.

6—The front wheels should toe in ⅞ inch at the bottom, that is, the lowermost portions of the wheels should be ⅞ inch closer toward the center of the car than the uppermost portions. No foregather is employed on the Ford cars.

FOUR-POSITION SWITCH

In Motor Age of April 25, "Lawrence" writes from New Orleans asking for an illustration showing the wiring diagram of a switch giving four positions for wiring of magneto and battery system so that four positions could be used, magneto, magneto and battery, off, and battery.

A switch of this kind has been fitted to Lozier stock cars for the past 3 years and the wiring diagram is illustrated in the Lozier book of instructions. A reproduction of this diagram is shown in Fig. 9.

Oil Grinding the Valves

Minnesotan Suggest Easy Way of Seating Valves When Not Badly Pitted

SAUK CENTER, MINN.—Editor Motor Age—I have a way of expediting matters in valve gringing, when the valves are not pitted but still leak owing to gumming up and carbon deposits which sometimes form and prevent them from closing properly. This is the way I have saved a lot of trouble and got splendid results: I leave the spring in place, open the cap to the valve chamber, insert the valve tool, and am ready for business. It is best to have one to help do the work although it can be done alone.

Take a good squirt oil can which will hold a pint of oil and fill with kerosene oil. Now have the helper carefully crank the engine until the valve being ground—use no emery or anything of an abrasive nature—slightly lifts up from its seat and then pour in a lot of oil, meanwhile turning the valve one-half or two-thirds the way around and back until the oil gets thoroughly worked around the seat and stem of the valve. Have the helper turn the crank until the valve rests firmly on its seat, then give it more kerosene oil and put all your weight possible on the grinding tool, continually working the grinder back and forth, never clear around; and continue for 10 minutes. Take some good cylinder oil and have the valve lifted again by turning the crank the same as when using the kerosene. Continue this operation for about 5 minutes and your job is done, and well if you use plenty of oil. Replace the valve cap, and repeat for as many cylinders as you have in the motor. After you are done pour into each cylinder about one-half teacup of good cylinder oil and closing all cocks turn the engine over slowly, with ignition cut out. Leave it over night and next morning crank the motor slowly to work the cylinder oil down onto the rings, then drain your carbureter as some of the lubricating oil will go down into the carbureter and make starting rather hard.

It is best to prime your motor by turning into the relief cocks about a tablespoonful of gasoline before you turn on the switch. Test for compression before you start the motor and you will be more than surprised at the springiness and strength of the compression, saving the trouble and time spent in taking out the valves and those mighty quick springs. Many times this is all the grinding a motor needs, for the valves seldom pit unless the car has stood for a long time in a damp place where moisture would form on the seats thereby creating rust or a pit.

By observing this little plan you can easily keep your motor in the best possible condition without any grit being used with its liability to get down on the stems, tappets and cam-rods, let alone working into the cylinders by a careless hand, and causing a vast amount of damage to your motor. I have tried this many times and was always rewarded by the best possible results. It is so much more easily accomplished than grinding with abrasives, as usually the novice grinds too much and by slightly changing the timing of his valves causes his motor to lose power, for .0001 inch makes a great difference in absolute valve work. At times I have known of more than this amount being taken off the seats when they did not need more than valve-cleaning as I have illustrated.—A. D. Carpenter.

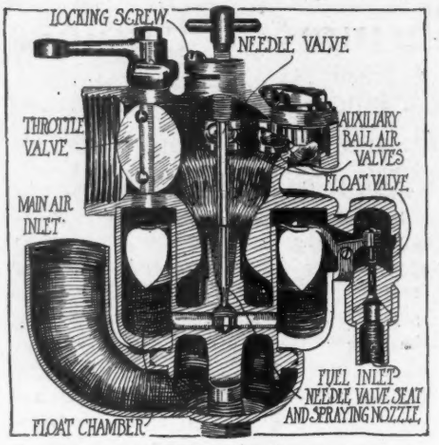


FIG. 7—KINGSTON CARBURETER

SIZE OF MARMON WASP

San Francisco, Cal.—Editor Motor Age—1—What is the gear ratio of the 4-40 on third and fourth speeds?

2—As a general rule is a four or six-cylinder car the fastest?

3—What are the dimensions of the motor used in the Marmon, winner of the 500-mile race at Indianapolis?

4—I have a four-cylinder 1911 Studebaker-Garford. What speed should I get out of it? If I put an auxiliary air on it would it increase the speed?

5—Which is the more economical, an L or T-Head motor? Which is the more powerful?—George Fisk.

1—To what car do you refer? There are several cars of model 4-40.

2—Of two motors having the same piston displacement, the six-cylinder motor should have slightly greater speed, other things being the same. Of two motors of the same cylinder dimensions the six-cylinder motor would have much the greater speed, for it develops 50 per cent more power, other things being the same.

3—The Marmon Wasp, driven by Harroun, winner of the 500-mile race at Indianapolis last year, had six cylinders, 4½ inches bore and 5 inches stroke.

4—With car in good condition, you should get 55 or 60 miles per hour, according to the makers. An auxiliary air intake usually will increase the speed.

5—The T-head cylinder construction usually is given credit for being slightly more powerful and efficient than the L-head construction.

Kingston Adjustment

Method of Regulation of Ball-Valve Vaporizer Described and Illustrated

GAYLORD, MINN.—Editor Motor Age—Please explain how to adjust a Kingston carbureter. Directions received with the car said to open the needle valve about three-fourths of a round. If I do that the car, a light runabout, consumes a gallon of gasoline in every 6 miles. When I open the needle valve one-third of a round I get the best results, but it still lacks the snap a car should have. The roads have to be extra fine in order to run on high speed. Sometimes I imagine that the valve or valves of the auxiliary intake refuse to work, hence the large consumption of oil.—A Reader.

The method of first adjusting the carbureter is to loosen the locking screw, Fig. 7; then turn the needle valve to the right until entirely closed. Then turn it about one complete turn to the left for preliminary start. To obtain correct adjustment on the gasoline, when the engine is running, set the spark in a retarded position and slowly turn the needle valve to the right until the engine back fires through the carbureter, noting the position of the needle valve; then slowly turn the needle valve to the left until the engine has reached the maximum speed. This adjustment obtained, tighten the screw which locks the needle valve; the auxiliary air, which is controlled automatically by the floating ball valves, will take care of mixture for speeds above and below this.

Your trouble may be due to an air leak which spoils the mixture at low speeds unless an exceptionally rich adjustment is made; that is, sufficient air may get into the mixture after it leaves the carbureter, that in order to get the motor to run regularly at comparatively low speeds, it must be adjusted so that an excessively rich mixture is required.

The air leak may be due to a faulty gasket either where the carbureter joins the inlet pipe, where the inlet pipe is connected to the cylinders; or, if the motor is an old one, it is possible that the valve guides are so badly worn that air gets past the valve stem.

It also is possible that your valves need grinding. Test the compression by cranking the motor over slowly. See that the compression is of an elastic nature, and that the resistance in cranking remains comparatively constant for a reasonable length of time; that is, that the pressure does not leak out of the cylinders too quickly. If some of the cylinders are weaker than others, these are the ones whose valves probably are in the most need of grinding. The correct methods of grinding the valves have been described very often in these pages. You are referred to the instructions in the Reader's Clearing House for March 21.

Regulation of Schebler

How to Set Model D Carbureter for Greatest Power and Fuel Economy

TOLEDO, O.—Editor Motor Age—Will Motor Age kindly instruct me how to adjust the Schebler carbureter which was part of the equipment on the Buick model 14 of 1911, also what the change should be from cold to warm weather, and which is better, a weak or strong mixture?

2—What is the purpose of the valve plug in the bottom of the crankcase in this model? Is it a breather and is it supposed to be open, and should the ball be at the top or bottom of the spring? Should tension of the spring be strong

3—At what tension do the drive chains on this model operate at their best?

4—Why has the Buick dropped this model, and will the company be able to supply extra parts in the future?—Bud.

1—The model D Schebler carbureter was used on the Buick model 14 car, and a sectional drawing of it is shown in Fig. 8. To adjust this carbureter, first see that the air valve A seats lightly but firmly. This is regulated by adjusting the screw M. Turning the adjusting screw to the right increases, and turning to the left decreases the tension of the air valve spring O. The needle valve E should be closed and then opened about three-quarters of a turn.

For low speed, retard the spark lever, and open the throttle about one-fourth. Turn on the gasoline, and after waiting a few moments for the float chamber to fill, start the motor. Close the throttle as much as possible without stopping the motor. Turn the needle valve E to the right, which decreases the supply of gasoline, until the engine runs smoothly without misfiring. The throttle should be set by screw S to prevent closing completely.

In making adjustment for high speed, open the throttle wide and advance the spark about one-quarter. If the engine does not run smoothly, and back-fires, it indicates that the tension of the air valve spring is too weak. If, after two complete turns of adjusting screw M to the right, the irregularity is not eliminated, give the needle valve about one-tenth of a turn to the left, increases gasoline.

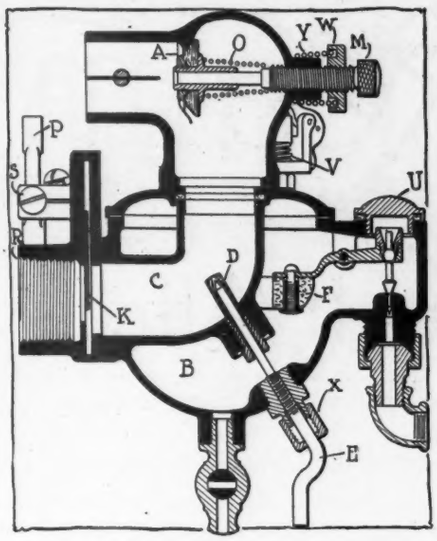


FIG. 8—ADJUSTMENT OF SCHEBLER

As the weather grows warmer, the proportion of gasoline in the mixture generally can be cut down. The best mixture is the one which is neither to weak nor too rich; and the best mixture produces the greatest power and speed.

2—The valve plug to which you refer is for the purpose of draining superfluous oil from the crankcase. The tension of the spring should be weak.

3—It is recommended as good practice to keep the chains just so tight that when the portion stretched between the tops of the sprockets is taut, the lower portion can be raised about 3 inches.

4—The model was dropped because there was no demand for it; parts can readily be obtained from the Buick factory.

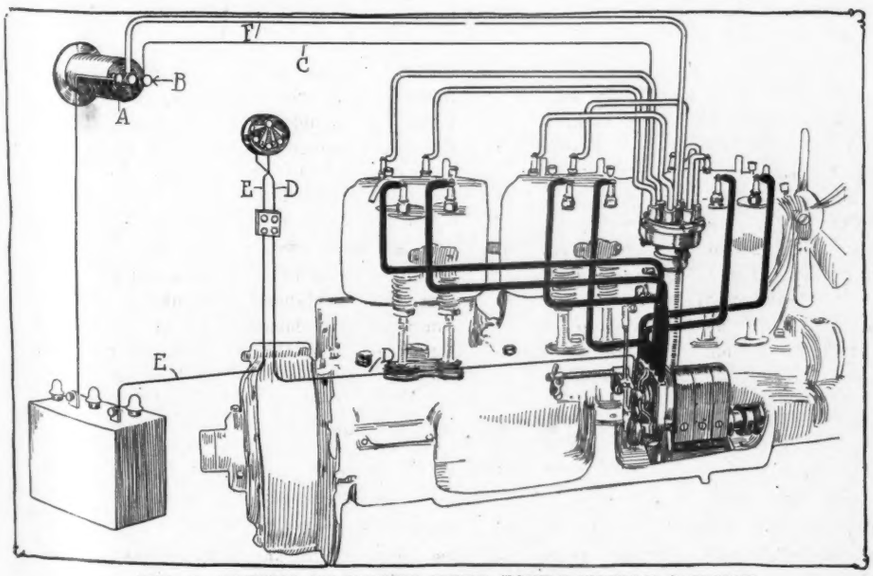


FIG. 9—WIRING OF LOZIER WITH FOUR-POSITION S WITCH

Why the Motor Sticks

Trouble Usually Caused by Stuck Main Bearing Due to Insufficient Lubrication

PITCHER, N. Y.—Editor Motor Age—Did Motor Age ever know of a case where the engine could not be turned over with the crank after it had stood idle through the winter? Last fall the car ran finely. It was put up for the winter about the last of October. During the month of December I ground the valves and cleansed the engine up, then I cranked it and let it run to see if the valves worked as they should. The engine ran well and seemed to have plenty of power. Then I drew off the water and left it until the last of April.

After putting on the tires I tried to turn the engine over but I could not start it an inch. I tried throwing in the high-speed gear and pushing the car while someone else pulled on the crank, but we were unable to stir it. Then I put a small quantity of kerosene in each cylinder, thinking perhaps old oil had thickened on the cylinder walls and piston. There has been oil in the crankcase all winter. The engine seems to be solid, that is, the crank will not rotate no matter how much force is applied. The car is a Flanders 20. It always has run well until this trouble. I have thought of putting hot water in the radiator in hopes that would loosen up the oil after it thoroughly warmed the cylinders.

Could there be any trouble with the cranks or crankshaft after standing several weeks?—Ralph Bennett.

It has been suggested that your trouble most probably is caused by a stuck main bearing due perhaps to your having run your motor without sufficient lubrication while testing the valves after grinding the last time the motor was run. If this is the cause of your trouble it will be necessary to have the motor taken down and a new main bearing fitted. Motor Age would advise, however, that you try to loosen your motor up somewhat by soaking the piston with kerosene and squirting kerosene around all the bearings in an effort to loosen them up so the motor can be turned over. If you should get the motor free, give it plenty of oil and crank it for a few minutes with spark plugs, and perhaps the valves, removed, in order to give the oil a chance to work into the bearings; then start it, giving it plenty of oil for a few hours at the beginning of the run.

It also is possible that a valve is stuck, or that something has dropped into the gears, or some such trouble has occurred which causes your motor to bind. If none of these suggestions helps you, it would be advisable to communicate with the Studebaker Corporation at New York city. The maker may be able to make a suggestion which will be of benefit.

The Realm of the

Topography as It Affects Truck Work

In Pittsburgh a 2-Ton Machine Competes with Two-Horse Rig Because of Hills

Chicago on the Level Has to Use 5-Ton Power Vehicle for Same Hauling

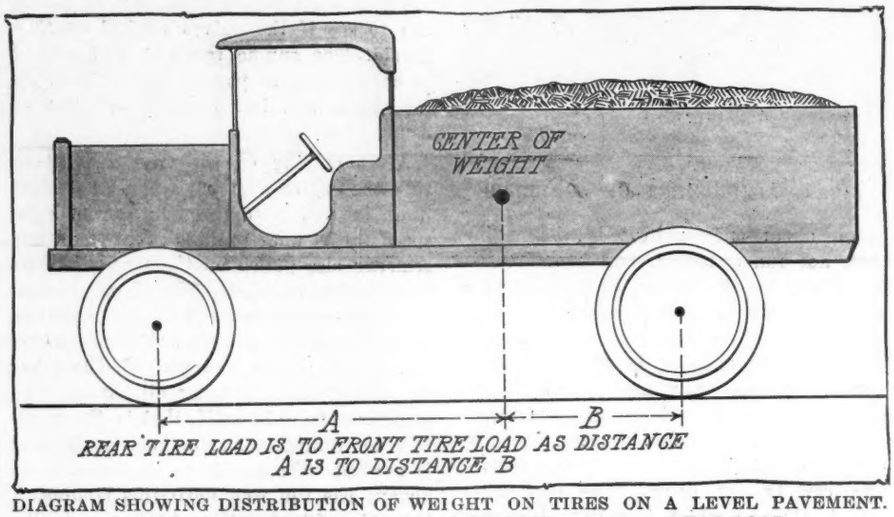


DIAGRAM SHOWING DISTRIBUTION OF WEIGHT ON TIRES ON A LEVEL PAVEMENT. LINE B REPRESENTS FRONT TIRE LOAD ; LINE A, REAR LOAD

By William B. Stout

THE average load for a two-horse team in Pittsburgh is 2 tons, in Chicago it is 5 tons. The difference lies in the fact that Pittsburgh is hilly and Chicago flat.

This condition has a direct bearing on motor truck operation in not only the two cities mentioned but in all similar cities, first mechanically and second from the standpoint of competition with the horse in service. A motor truck which is a huge success in a flat city like New York may be a flat failure in a hilly city like Baltimore or St. Paul and vice versa.

Efficient Brakes Necessary

A motor truck for hilly service first of all must have large-surfaced and efficient brakes. Second, it must have power to climb steep grades with full loads. Since modern motor trucks can fulfill these conditions there is no real reason why a 2-ton motor truck in Pittsburgh cannot carry its full capacity in service. Thus in Pittsburgh to show the prospective buyer the cost advantage of a motor truck over a horse the 2-ton truck can enter into direct competition with a two-horse team. If it carries its 2 tons for twice the mileage it can make a fine showing of relative cost. If a 5-ton truck carries its load for the same mileage as a two-horse rig in the same time it is making a good showing.

In Chicago on the other hand where the city is level a truck must compete with a two-horse 5-ton load at the speed of horses on level streets. A 2-ton truck therefore would have to cover two and one-half times the mileage of a two-horse team to make a showing, while a 5-ton truck would be competing with a 2-ton machine on an equal tonnage basis.

In other words, in Pittsburgh a 2-ton motor truck is the natural competitor of the two-horse equipment while in Chicago a 5-ton machine is more usual. This fact has a very direct bearing on the cost comparisons of the two modes of goods transportation.

Lines of business to which trucks are well fitted in Pittsburgh might find the motor vehicle a losing proposition in Chicago. This shows how inadequate for any prospective user are comparative figures from outside cities when studying toward the use of these vehicles in another city. Every case of truck use has its own conditions which may double cost of operation over your neighbors or halve it as the case may be. No one man's figures on his service can fit another's. Trucks are a success but their way must be paved with gray matter or they will fail as would any other machine that is run haphazard.

Needs in Hilly City

The hilly city throws mechanical demands on the truck itself very different from those met in the level community and yet no more severe, for though the hilly section may demand high engine speeds on low gear, the level-city machine receives the abuse of high speed which not only races the motor—if there be no governor fitted—but subjects the whole structure and mechanism to abnormal road shocks not met in the hilly place. Speed of truck is harder on machinery than hills galore. Actual tire wear is less on hills as well, although tires give out quicker in the hilly places through stripping, etc., through the amount of terrific low gear strain. That is one reason why tires in Pittsburgh and Baltimore are guaranteed for 1,000 miles less service than in Chicago and New York.

Overloading Trucks

Another aspect of the truck situation in level and hilly places is seen in the overloading proposition. In Chicago, for instance, a truck of average gear can haul much over the rated load of the machine so far as engine power is concerned, so that there is the temptation to give the truck all it will pull. This means overload to an abnormal extent and Chicago users are but just waking up to the fact that overload does not pay. With the high speed coupled with this overload it is no wonder that some users in Chicago met with high upkeep cost in their early truck operation.

In hilly country the overload comes mainly on the rear wheels which for this work are generally set pretty far forward. Thus on the climbing of hills a large percentage of the whole truck load shifts to the rear wheels, while on down hill stretches there is a small overload on the front tires. This overloading especially in the case of the rear wheels is greater than can be gotten in a flat city, which is another reason for short tire life in hilly districts. This leads one to believe that eventually tires in these cities with steep grades will be considerably oversized at the rear.

Commercial Car

Building Material Weights Tabulated

Advent of Motor Truck Brings About Demand for Loading Information

Clay, Dirt, Gravel, Sand, Lime, Asphalt, Etc., Tabulated as to Space required

HAULING building material, especially in big cities, involves many problems not met with in any other line of endeavor. Chicago, as a typical example furnishes many features of this class of haulage which show just what the motor truck will have to contend with in this service.

The truck itself, in the first place, must be fitted for its work, and this fitting will depend on the class of material the machine will haul. To judge of this a certain classification of these materials is necessary with the relative weights of each per cubic foot or shown in the number of cubic feet to the ton.

Peculiarities of Sand

Sand itself may weigh from 80 to 115 pounds per cubic foot depending on the amount of moisture absorbed in it. The weight of damp sand averages about 96 pounds. Sand loose takes up less space than when shaken down, the voids, or space unoccupied in a load of this kind, running to from 30 to 50 per cent of the bulk. In Chicago the profit from handling sand by teaming companies runs around 10 cents per ton so that for a while at least there will not be much field for this class of haulage in the Windy City where congestion is so great, and unloading stops taking up an hour or more of time.

Eighteen cubic feet of clay weighs 1 ton.

Twenty-one cubic feet of ordinary earth weighs 1 ton.

Twenty-two cubic feet of sand (average) weighs 1 ton.

Nineteen cubic feet of gravel weighs 1 ton.

Lime weighs in the neighborhood of 65 pounds per cubic foot in bulk, or about 30 cubic feet per ton.

Asphalt weighs 83½ pounds per cubic foot or about 24 cubic feet per ton.

Portland cement weighs 85 to 90 pounds per cubic foot.

Pressed brick weighs 150 pounds per cubic foot, 13⅓ cubic feet per ton.

Fifteen hundred vitrified facing brick weighs 5 tons.

Ordinary brick weighs 125 pounds per cubic foot.

Body Sizes Necessary

Taking these figures as a basis some idea of the body sizes necessary for a 5-ton chassis can be arrived at, taking the general average dimensions of the box as 5½ feet wide and 12 feet long.

BUILDING MATERIAL

	Cubic feet
1 ton of earth occupies	21
1 ton of sand occupies	22
1 ton of clay occupies	18
1 ton of gravel occupies	19
1 ton of lime occupies	30
1 ton of asphalt occupies	24
1 ton of Portland cement occupies	23
1 ton of pressed brick occupies	13.5
1 ton of ordinary brick occupies	16

BODY HEIGHTS

Body heights for 5-ton loads, body being 5.5 feet wide and 12 feet long, would be:

Sand body	1 ft. 8 in. high
Gravel body	1 ft. 5 in. high
Dirt body	1 ft. 7 in. high
Clay body	1 ft. 4 in. high
Lime body	2 ft. 4 in. high
Ordinary brick body	1 ft. 3 in. high
Pressed brick body	1 ft. high
Asphalt body	1 ft. 10 in. high

Five tons of sand occupy 110 cubic feet; body, 5½ feet by 12 feet by 1 foot 8 inches.

Five tons of gravel occupy 95 cubic feet; body, height 1 foot 5 inches.

Five tons of earth occupy 105 cubic feet; body, 1 foot 7 inches high.

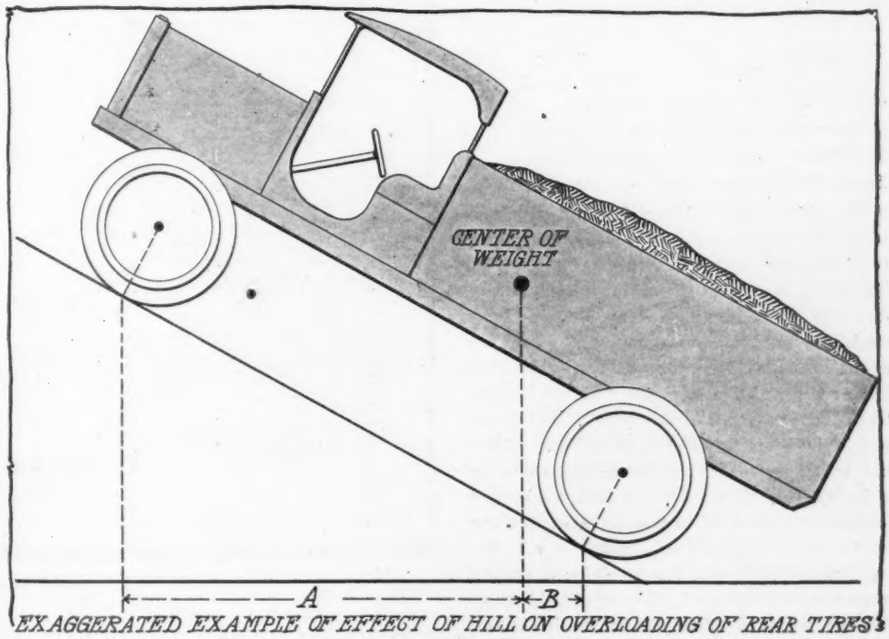
Five tons of clay 90 cubic feet; body, 1 foot 4 inches high.

Five tons of lime occupy 154 cubic feet; body, 2 feet 4 inches high.

Five tons of brick occupy 66 cubic feet; body, 1 foot high.

Five tons of asphalt occupy 120 cubic feet; body, 1 foot 10 inches high.

These are the relative heights to which the actual load would come on a body whose floor was 5 feet 6 inches wide, and 12 feet long, area, 66 square feet. It is thus seen that for this work—outside of lumber handling which does not rightly come under the list of the building materials with which we are dealing being a separate branch in itself—a small body is sufficient for this work even on a 5-ton truck, and an increase in size of body in this line of work, where weights per cubic foot are so high and the load dead is dangerous as inviting a big overload.



EXAGGERATED EXAMPLE OF EFFECT OF HILL ON OVERLOADING OF REAR TIRES

SHOWING THE CHANGE OF PROPORTIONATE LOAD ON TIRES WHEN MOUNTING A HILL. LOAD ON REAR TIRES IS GREATLY INCREASED

Even making the body box a foot longer than the dimensions given, leaving other dimensions as they are would mean roughly—if the box were filled full as it undoubtedly would be—an overload of 825 pounds in the case of brick hauling.

If in loading on brick the carriers were to add one layer extra, as they would be likely to do, there would be an overload of nearly a ton and a half in the case of brick and more if it were the vitrified variety.

Chance on the Hills

For hilly cities where horse loads are not large comparatively there should be an open field for motor vehicles for the hauling of building materials even now, but in Chicago conditions are scarcely ripe. In particular is this true as regards loads. "The condition can be summed up pretty well this way," said one large dealer in building material, "A motor truck that will haul a 5-ton load of vitrified brick will cost me $5,000 for the kind I'd want. It will carry but 1,500 vitrified facing brick to a load.

"For that $5,000 I can get five of the finest teams I want to buy, and their load will be the same, 5-ton each, 1,500 bricks. To make good against these the 5-ton truck, costing five times the amount of one team, will have to travel five times as far, and you will have to show me a truck that can do it and wait from 20 minutes to 2 hours to unload each consignment.

"Again if a horse casts a shoe I can put another horse in its place and only one-fifth of my investment is idle while the repair is being made. With the truck $5,000 is idle if a bolt breaks."

This same firm, however, expressed itself as satisfied that the motor truck is a coming proposition even if it might cost more. It is a question not entirely of cost but of service to the customer and if one firm puts in motor trucks to deliver the goods the others must follow. The extra cost if any—and there will be an extra cost at first until systems get adjusted—will be paid by the consumer for the extra efficiency of the service.

Hauls in Chicago

The hauls in Chicago in building material deliveries range from half a block to 10 miles, averaging about 2½ miles. There are a few of these long hauls every day but not enough to keep a truck busy with any one firm. Even at that, delivery conditions may be wrong at the other end.

Many flat buildings are put up in sections before streets are put in, and the result is bad for the contractor. When the earth is wet as in the spring or after a heavy rain there always is trouble and loaded wagons sink to the hubs in getting in to buildings. It often takes all the two-horse team can do to get an empty wagon across some of these spots. Naturally a truck in such places would be of little use. Even horse delivery must wait for weeks sometimes for the ground to dry before deliveries can be made while the contractor tears his hair.

While the average two-horse load averages 8,000 pounds a 5-ton load is not uncommon. Loads are 25 per cent lighter in slippery weather. Most firms average 2 tons per horse on one, two and three-horse rigs. The average stop for delivery is around 45 minutes. Delivery operation continues through 10 hours of every day. Loads are for the most part put on in bags in a comparatively short time. Fifteen miles is a good day's work for a team.

Where buildings are going up in the central district of Chicago it is a common sight to see a long row of wagons waiting for entrance into the new structure. The Otis building, recently put up in Chicago was no exception to this and often eight wagons were waiting their turn in line across the street, holding back other traffic along an important thoroughfare.

Wagons can enter these new structures but one at a time, while foot passengers on the sidewalks are held back for its passing through the door entrance. Once inside, there is just room for the wagon to stand and deliver the load. Before the next team can come in this load must be shoveled up from the floor and distributed. A $5,000 motor truck waiting its turn in such a line would be losing money for its owners at an abnormal rate.

Builders Give Figures

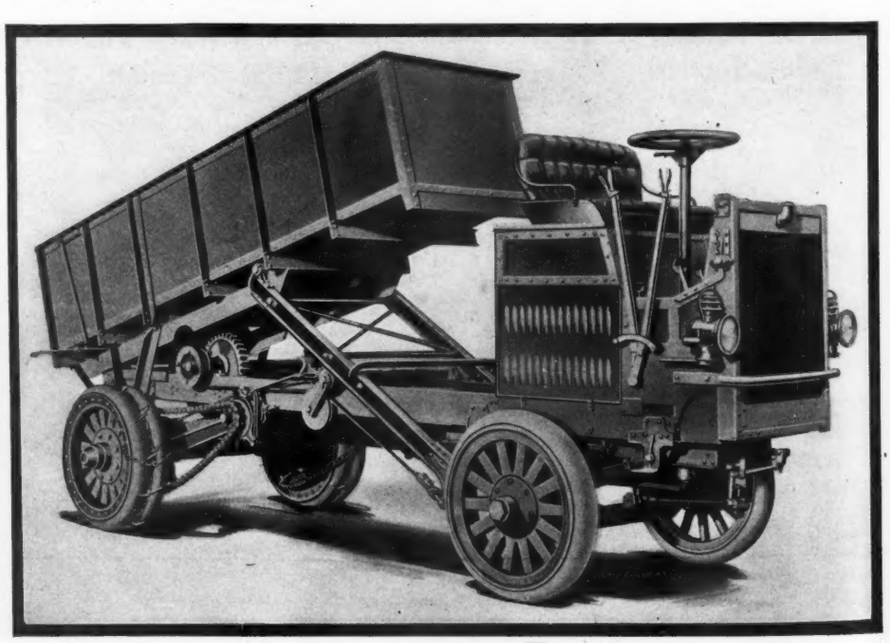
Figures were presented at a recent national convention of the Builders' Supply Association in regard to 3 years' use of motor trucks by a certain eastern firm which are interesting. This firm figured on overhaul at every 15,000 miles on a 40-mile per day basis. It planned on a general rebuilding of the machine at a cost of $300 every 2 years. All this brought repairs to 3 cents per mile. Tires on guarantee cost 6.1 cent per mile, the original cost being $488. A life of 6 years was figured on for the car, amounting to 7.5 cent per mile. Gasoline was put at 3 cents per mile and oil at .4 cents per mile. Interest on the $5,000 investment was figured at 5 per cent on 250-day use, amounting to $1 per day. Four kinds of insurance were carried—liability, fire, collision and theft—at a cost of $150 per year: 60 cents per day. Garaging, cleaning and minor repairs and adjustment by contract cost $25 per month or $1 per day. Drivers were graduated teamsters, paid 25 to 50 cents more per day than when at horse work. Two dollars per day was the wage.

All this brought the total per diem cost to $4.60 or 20 cents per mile. All of this figuring was placed as "known charges." The rest was figured from service.

Time Used in Loading

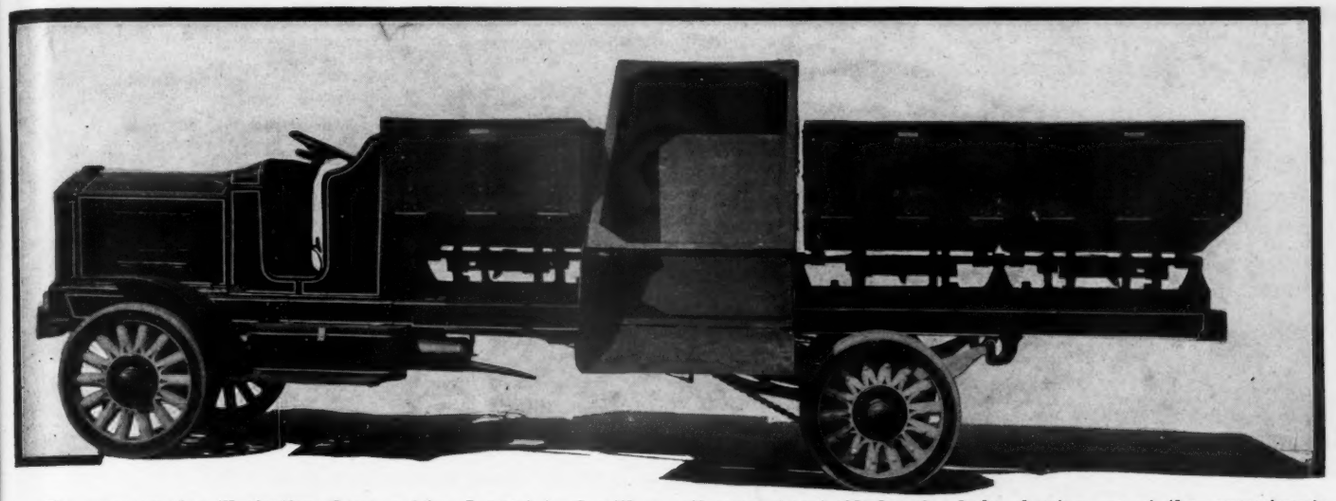
In operation the loading ordinarily took 20 minutes, the trip was 2½ miles each way, 5 miles all and occupied 35 minutes. Unloading took 15 minutes and contingency time was allowed as 5 minutes while eight trips were made per day per truck, and 40 miles were covered. The daily tonnage per vehicle was 36. This is but one case and, as the writer stated, it has been the experience of all transportation engineers that one man's figures do not help materially to judge another's service. The only way is to get on the job with a stop-watch.

The day of the truck is coming in the building field, and changes being made are tending toward it. This is but another instance of how the motor truck when it is universally adopted, as it will be within a few years, will revolutionize our life.



G-M-C DUMPING BODY

The new G-M-C automatic dumping body is raised by the power of the motor, transmitted through the intermediary of a gearbox to the body-raising winch drum. The drum is operated by a self-locking worm and wheel, permitting power-raising and power-controlled lowering of the body. The raising and lowering is controlled by two hand levers at the driver's seat. This body can be used on both the 3 1/2 or 5-ton chassis



The accompanying illustration shows a 4-ton Longest truck with a unit compartment side-dumping body, showing one of the compartments dumped to the left side. It can be dumped the same way to the other side. The compartments, as suggested by the title, are a unit each and built thus to prove a time and trip-saver for handlers of coal, gravel, sand or similar substance. Four different varieties of loads, a ton each in weight if desired, may be carried on one trip and delivered to separate firms. The vehicle is manufactured by the Longest Brothers, of Louisville, Ky.

Montreal Outlines Motor Bus Rules

THE new Montreal by-law governing the operation of motor bus lines within the city limits has been drafted by Alderman LaPoints. One of the features of the new by-laws is that any company operating a motor service must provide a seat for each passenger carried. The capacity of each will be established by officials of the city and this limit must not be exceeded by the company operating the line. During the rush hours, or between the hours of 8 and 10 A. M. and 2 P. M. and 5 and 7 P. M. companies operating motor buses must provide a 5-minute service on the streets authorized by the city. At other hours and on Sundays and holidays, a 10-minute interval between the buses will comply with the civic requirements.

The fare charged by the operating company, according to the by-law, must not exceed 5 cents and transfers good at terminal points must be furnished upon application. School children are to be provided with special tickets at the rate of ten for 25 cents, while children in arms are to be carried free of charge.

The speed at which the buses are to travel along the streets must not exceed 9 miles per hour or more than 4 miles when crossing streets or turning corners. Stops are to be made before crossing the streets, as is the case of the electric car and no bus is to embark passengers at other points than at these corners. Conductors employed on the buses are to be able to speak both English and French, and must call out the stops in both languages. All printed matter respecting the regulations and routes of the operating company carried on the buses are also to be in the two languages, according to the terms of the by-law. The buses are to run the year round and are to have the right of way between the curb and the outside ridge of the street railway tracks.

Employes are not to be compelled to work more than 8 hours per day or more than 48 hours per week. The new enactment also provides for the carrying of regulation signs on the buses and colored lights of a nature to denote the different lines at night.

Aldermen Considering Regulations to Govern Proposed Transfer Line

BOSTON AFTER MORE APPARATUS

Mayor John F. Fitzgerald and Fire Commissioner Cole of Boston made a trip to Springfield, Mass., last week to inspect the motor apparatus in use in that city for the purpose of arranging to get more motor apparatus for the Boston department. The city council now has a recommendation from the mayor asking that $50,000 be set aside for the purchase of motor vehicles to displace some of the horse-drawn vehicles, and now Councillor Timothy J. Buckley has drawn up an order for presentation to the body asking for an appropriation for motor patrol wagons that may be used for ambulance purposes as well. The councillor wants one for each of the outlying districts and two for the city proper.

NOW IT'S ALBION

Albion, N. Y., has bought a combination motor hose, chemical and ladder apparatus. The new truck is a Thomas six-cylinder with 70-horsepower motor. The equipment will include a 40-gallon chemical tank; 200 feet chemical hose; hose body with capacity for 1,000 feet fire hose; room for a crew of eight firemen; 20-foot extension ladder; 10-foot scaling and roof ladder; 3-gallon hand extinguisher; hose nozzle mounted on rear step. A 12-inch locomotive alarm bell will be mounted over the hose reel and a powerful searchlight to light up at night the interior of a burning structure to make lighter the work of the firemen will be included in the equipment of the new apparatus.

Albion has a high-pressure waterworks system for fire purposes so that no motor fire engine is necessary in connection with the new machine which will be housed in the local municipal building in the center of the town. Residents are highly gratified over the purchase of this motor apparatus, as they will secure a reduction in insurance rates and taxes as is customary where a machine of this kind is in use in a town or village.

DUNKIRK WANTS MORE APPARATUS

The fire and police commissioners of Dunkirk, N. Y., are so enthusiastic over the test recently given the new motor fire engine that they are proposing a plan whereby the hook and ladder wagon truck will be pulled by the motor engine, thus doing away with the horses in the local fire department. An official protest has been filed with the commissioners by the members of the Pioneer Hook and Ladder Co., the firemen declaring that the speed of the motor engine is too great for the attachment of an original horse-drawn truck as the lives of local residents would be greatly in danger, but the proposition of the commissioners, it is said, will be declared satisfactory by the city council because it will mean the saving of money.

VICTOR AWARDED CONTRACT

The Victor Motor Car Co., of Buffalo, N. Y., has been awarded the contract by the Buffalo fire commissioners for a combination chemical and hose wagon.

FIG. 1—FRONT OF NEW WHITE SERVICE BUILDING FOR GREATER NEW YORK FOR CARS AND TRUCKS

Service as Given by White

Big Building in New York Devoted Solely to Maintenance of One Make of Motor Car

Department a Business in Itself

Description of System Which Has Been Installed to Insure Satisfaction to the Owner

THE rapid development of the motor car as well as the enormous number of pleasure cars in use has given impetus to the establishment of service departments in conjunction with the branches of many companies and also by leading dealers in large cities.

The service department as understood here, is a building for the exclusive use of one make of car, in which repairs can be made by expert mechanics in the factory on touring or commercial machines, a department in which every detail of the vehicle is understood, thereby eliminating the chance of misdirected effort in repair work; a department in which a vehicle waiting delivery can be stored; a department in which a complete supply of spare parts may be carried, so as to render expeditious delivery to customers throughout the territory surrounding the service department; in a word, the ideal service department is a small factory department with factory ability, factory methods, factory facilities, factory supplies, and factory knowledge.

For White Cars Only

One of the more recent service departments established in New York city is that of the White company, opened some months ago. This service department is for touring and commercial vehicles, where all manner of repairs on these can be effected, where supplies for every White model, whether gasoline or steam, are constantly carried in stock, and where factory advice can be had. This service building is not used for garage purposes other than caring for the cars of the company used in demonstrating or other uses. Pleasure and commercial vehicles are handled as one in the garage, the repair shop and the department storage.

The selection of a service department in a large city is a point worthy of the carefulest consideration. It should be central if possible in order to be close to the zone of activity of commercial vehicles. So far as the touring vehicle is concerned, location is not such a factor. In selecting a location, Manhattan island was chosen in preference to Long Island. To be exact, the service department is on West Fifty-seventh street, between Eleventh avenue and the Hudson river. Fifty-seventh street is one of the widest cross thoroughfares in the city, having a road width of 100 feet. This makes it ideal for heavy motor vehicles, as there is no loss of time entering or leaving the building.

This new White service building, roughly speaking, is an oblong, two and one-half times as long as it is wide. Its overall dimensions are 250 feet by 100. It is a one-story building without basement and represents an investment, so far as building alone is concerned, of $75,000. This building, as shown by the ground plan, Fig. 5, is roughly divided into three departments, a garage at the right end occupying one-quarter of the building, a repair shop with offices in the center, occupying one-half the space, and an inactive storage space at the left end embracing a blacksmith shop and a carpenter shop, the whole comprising the remaining one-quarter of the floor space.

In Fig. 1 is given the general view of the front of the building, which is of red paving brick construction with artificial gray stone trimmings. The barrenness of the ordinary building is wanting, due to a heavy stone cornice, and carrying the walls slightly above this.

Interior Arrangements

Fig. 2 gives a good conception of the end view with the front, rear and central portions one-half story higher than the intermediate points, this construction permitting of vertical glass windows as indicated. The height from the floor to the ceiling proper is 14 feet, and it is 10 feet from the ceiling to the top of the three raised portions referred to. This allows of an enormous window area, giv-

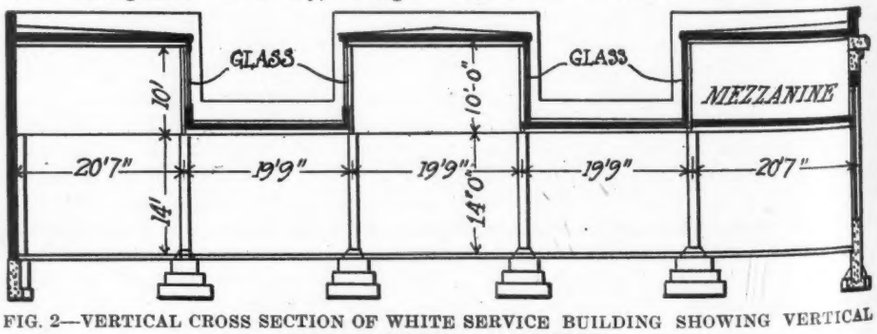


FIG. 2—VERTICAL CROSS SECTION OF WHITE SERVICE BUILDING SHOWING VERTICAL WINDOW OVERHEAD LIGHTING

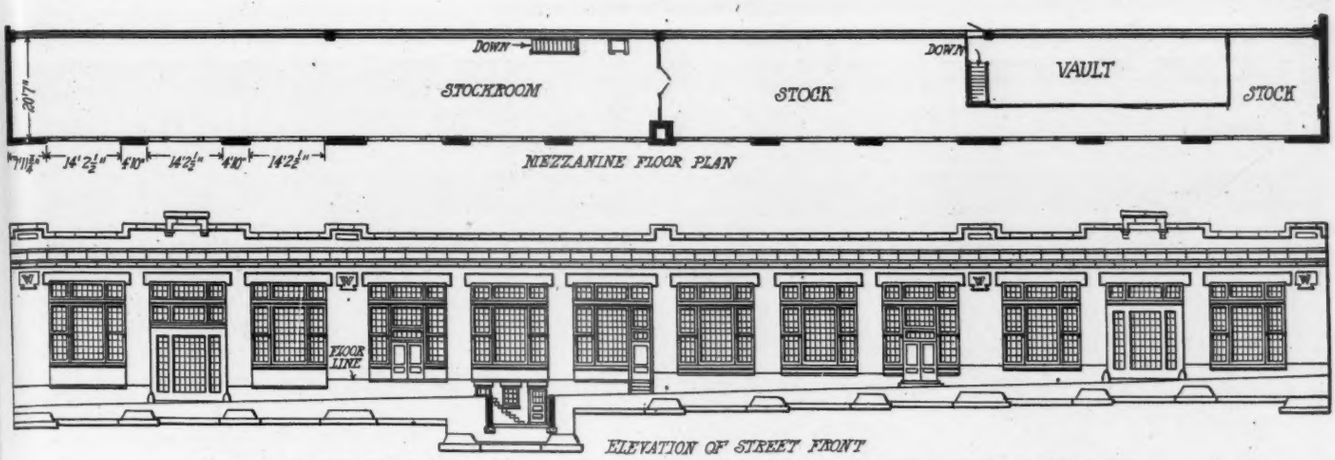


FIG. 3—FRONT ELEVATION AND PLAN OF MEZZANINE FLOOR IN WHITE SERVICE BUILDING

ing an overhead light for the entire garage, repair shop, and inactive storage department, stock room and everything but the offices and blacksmith shop. These windows are 6 feet high and made of wire glass. Hinged ventilators are regularly placed in these windows from end to end.

Workings of the System

The general modus operandi of the White service system is best gleaned from Fig. 5. The main entrance is into the garage at the right end, where a standard check-in and check-out system is used. Between the garage and the repair shop is a huge sliding door 14 feet wide, enabling the largest trucks to run into the repair shop without even having to maneuver in the garage. The wide central aisle from end to end of the repair shop enables them to back into their positions with ease. Between the repair shop and the inactive storage department is another 14-foot doorway through which the vehicles can enter in case they are waiting for some carpenter repairs. The entire freedom from pillars characterizes the building with the exception of the three in the center

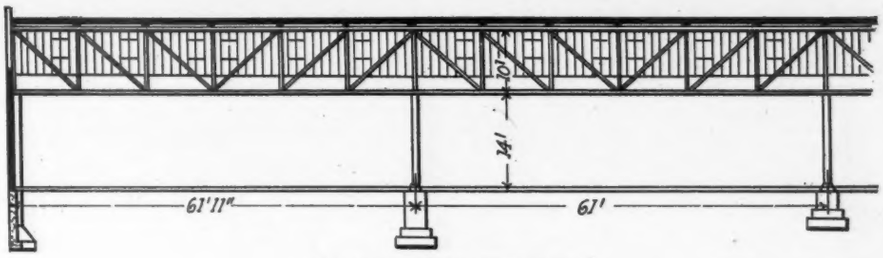


FIG. 4—VERTICAL SECTION OF ONE-HALF OF WHITE SERVICE BUILDING

of the repair shop, and these are so placed as not to interfere to any extent. The 14-foot ceiling allows of working on the largest truck with ease, and the wide doors made maneuvering simple. Locating the stock room and offices in the middle front of the building makes it possible for all business to be done without any necessity of entering the garage or repair shop. Between the offices and the stock room is a passage leading into the repair shop for the convenience of the workmen. At one side of this passage can be purchased stock room supplies by customers, and at the opposite of the passage are the cashier and bookkeeping departments, where the necessary entries of such sales can be recorded. The entire system is well worked out from the point of view of space economy and also economy of effort.

Garage Arrangements

In a department-to-department study of this service building, the garage is the correct place to start with. Entering the building through the enormous sliding door in the garage, three points force themselves upon the attention of the critic. These are height, light and freedom from pillars. The garage space is 100 feet by

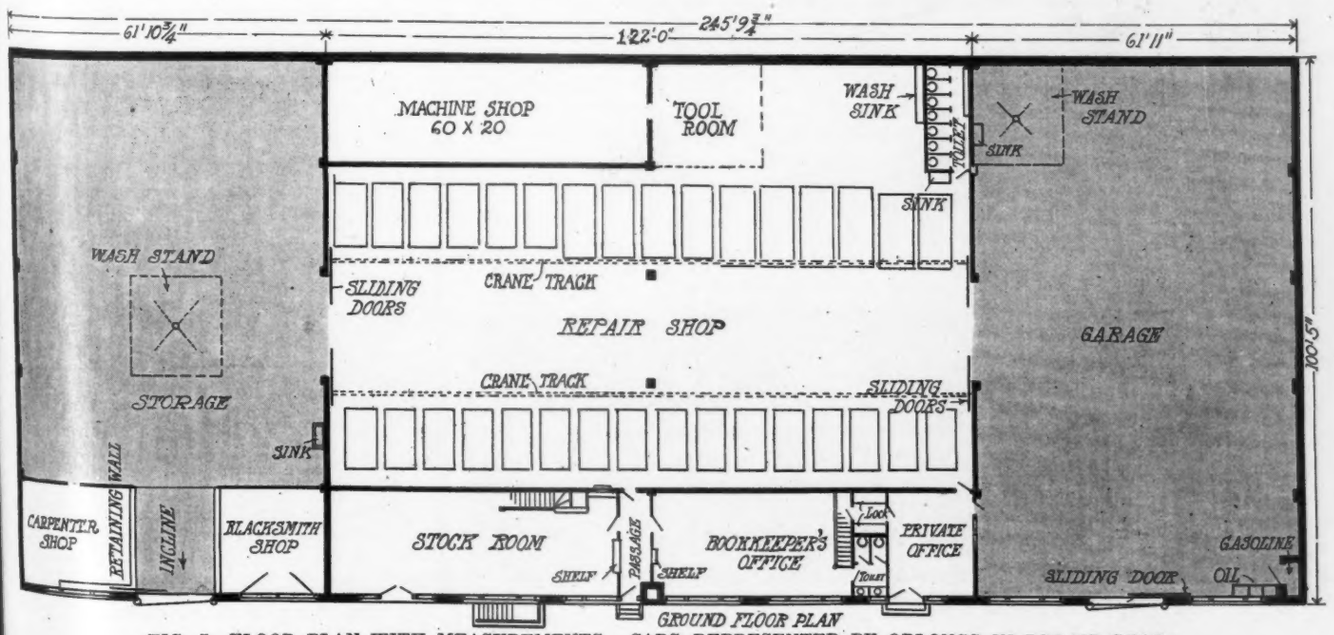


FIG. 5—FLOOR PLAN WITH MEASUREMENTS. CARS REPRESENTED BY OBLONGS IN REPAIR SHOP

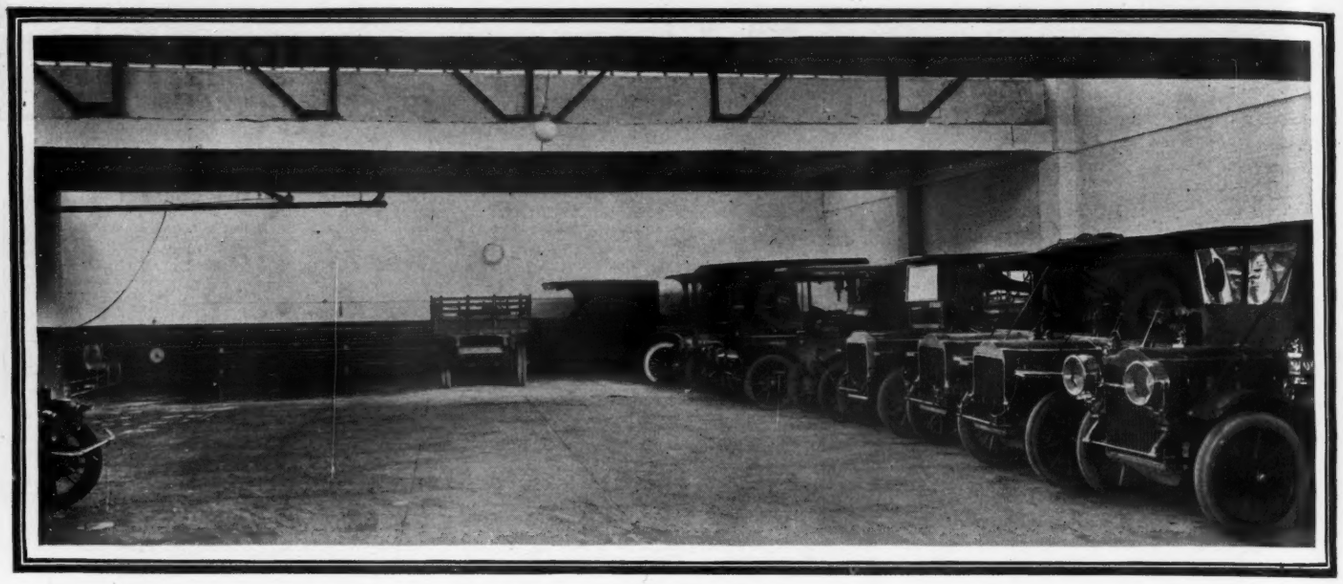


FIG. 6—GARAGE IN WHITE SERVICE BUILDING—NOTE ABSENCE OF PILLARS

62 feet, and it has not a single pillar. Here twenty-seven pleasure vehicles and trucks can be backed up around the walls and a dozen more, late comers at night, located in the middle of the floor without congestion and not a pillar to interfere with the entire operation. The door is 14 feet high, the ceiling is the same height, and as the largest van-type of motor vehicle is little over 12 feet, there remains nearly 2 feet of overhead clearance, making the garage suitable for the largest type of vehicle in use. In this garage are stored demonstrating pleasure cars, demonstrating trucks, new vehicles waiting for delivery, and others that may be waiting to enter the repair department.

In one corner, to the right at entering, is the conical brick gasoline vault, with its huge fire-proof door. The vault contains a rotary pump for lifting the gasoline from two tanks with 550 gallons capacity buried in concrete, according to regulations of the New York underwriters. The use of a rotary pump to fill the portable tank, which is wheeled into the vault, saves much time, as it is nearly three times as rapid as a measuring pump. Its use eliminates two measurings of the gasoline.

Gasoline Storage System

The oil supply system is located adjacent to the gasoline vault, and consists of three tanks of 100 gallons capacity each. One is for steam engine oil, a second for gas engine oil, and the third for kerosene. Self-measuring pumps are used in connection with each.

Diagonally opposite to the gasoline tank is the wash rack for both pleasure cars and trucks. It is 20 feet square and all washing is done between 6 p. m. and 8 a. m. The capacity between these hours being sixteen vehicles per night. Two washers and two polishers are employed. An economy of 15 per cent in the water requirements is effected by the use of an automatic nozzle, which, when released, shuts off the flow of water. This effects a great economy at such times when a washman might drop the nozzle to walk around the vehicle to do some other work. A portable spotlight is used to aid in the washing work.

A commendable feature in the garage is a series of customers' lockers of the steel fireproof type, located at the right side. These lockers are 44 inches by 44 inches by 2 feet, and are used by customers to store clothing, tools and any equipment when a vehicle is brought in for repairs. The customer is given the key to these lockers, the safe keeping of the parts being entirely under his control.

Lighting the Garage

A necessity in any garage is sufficient light. In the daytime the four vertical overhead lights and the large windows at either side of the sliding door afford enough. For night work arc lights are used and also an abundance of incandescent bulbs. According to the underwriters, all sockets for drop lights must be 4 feet from the floor, and the pin type of socket is used, the screw in socket not being permitted by the underwriters. Suspended pin sockets from the ceiling are located for convenience in examining machines in the center of the garage.

The repair shop, occupying the middle half of the building, is 122 feet by 80, and

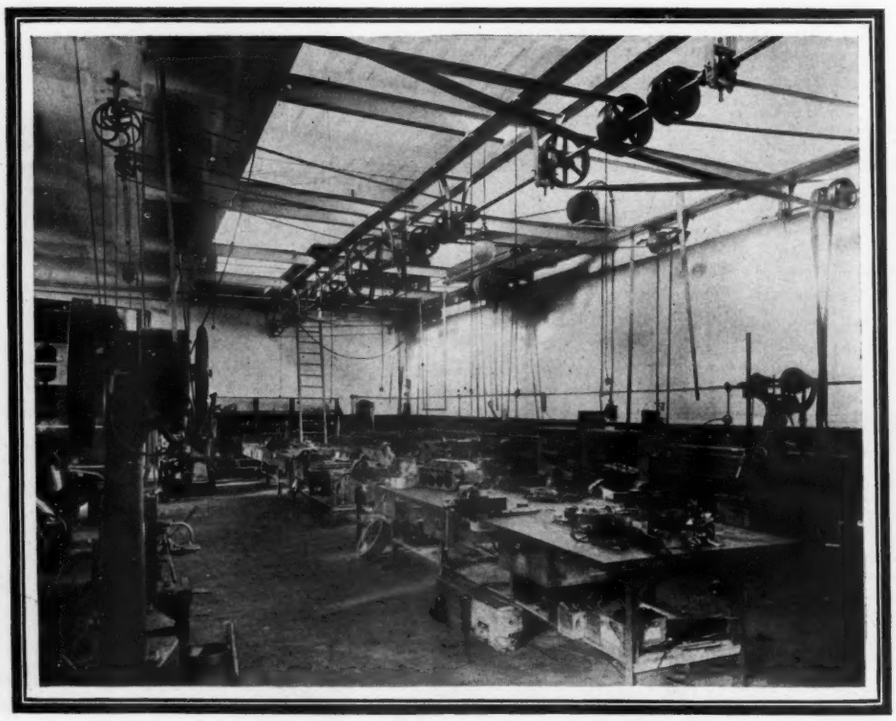


FIG. 7—MACHINE SHOP 60 BY 20 FEET IN WHITE BUILDING

has accommodation at one time for sixteen touring cars, six light trucks and ten of the larger trucks, a total capacity of thirty-two machines, without infringing on the large central aisle, which extends from the door entering from the garage to the door leading to the inactive storage department. The machine shop is located in one corner of the repair department, the space occupied by it measuring 20 feet by 60. To the end of it is a small space used for tool room purposes, and still further are work benches and the wash sinks. The repair shop is the only department in which the men do not work on a cement floor, as here the regulation concrete and cement floor has been covered by a wood flooring to make it easier on the workmen.

The vehicles, undergoing repairs in this department, are arranged as illustrated, Fig. 5, and to facilitate removal of motors or any parts from these vehicles there is a traveling crane on each side of the central aisle, these cranes working on overhead steel tracks from end to end of the department. In addition there is a large movable crane which can be used in any part of the department.

Arranging Work Benches

The force required to man a repair department of this nature consists of thirty-one workmen, twenty-four of whom are benchmen and the remaining seven floor men who work in and around the vehicles, in contrast with the benchmen, who work with machine tools. This force is further divided according to the abilities of the men, some specializing on motor work, others on gearsets, and others on axles, etc. This force works on a regular schedule from 8 a. m. to 5:30 p. m. with 30 minutes for lunch. Night work is not done except in emergency cases.

A good general conception of the machine shop is seen in the photographic reproduction shown herewith, Fig. 7, this space approximating 60 feet by 20 feet. In laying out this space the work benches are arranged end to end up the

FIG. 8—THE SMALL CARPENTER SHOP

FIG. 9—PART OF STOCK ROOM ON MEZZANINE FLOOR

FIG. 10—CENTRAL AISLE IN REPAIR SHOP IN WHITE'S NEW YORK SERVICE BUILDING

middle with an aisle on each side and the power-driven machinery in rows outside of these aisles. The machinery equipment consists of two standard lathes, two drill presses, one 24-inch gap lathe, one universal grinder, one planer, emery wheels, etc. All of this machinery is driven from an overhead pulley system, which, in turn, is operated through an electric motor, shown. This motor also drives an air compressor which is located similarly to it in the far corner of the department. The compressed air is used for tire inflation, cleaning upholstery, riveting, pneumatic tools and sand blasting. Direct overhead light is afforded for this entire department, and suspended pin sockets allow of adequate light for emergency night work.

The last department, namely, inactive storage, is used to store truck chassis awaiting sale, pleasure cars awaiting delivery, etc. The floor space is the same as the garage. In this department is located an emergency wash rack. In one corner of the department is a small blacksmith shop, approximately 20 feet square. According to New York underwriters' requirements it must have an outside door only, so that everything entering and leaving it must be taken outside of the building. The blacksmith shop force consists of one blacksmith and a helper, the standard blacksmith shop equipment is fitted, and the work confined to brazing, forging, welding, sand blasting, and cleaning of generators for steam cars. The carpenter shop is located in one corner of the inactive storage department. It is manned by two workmen.

One of the essentials of every service department is an adequate stock equipment, and in this respect this White service department has met every requirement. This department serves approximately a territory with a population of 8,000,000. The stock has to be constantly carried on hand, is worth $100,000. Roughly speaking, it is divided into two departments, one for gasoline vehicles for the pleasure or commercial, and the other

What an Automatic Dynamo Lighting

Important Points Include Candlepower of Lamps, Machine Output, Speed and Method of Driving Generator, Capacity of Storage Battery and Type of Wiring to be Employed

Editor's Note—The following paper by Leonard Kebler was presented at the April meeting of the Metropolitan section of the Society of Automobile Engineers.

IN determining the necessary qualifications for a dynamo lighting system for any particular use, the following points immediately become of importance.

1—The lamps to be used.
2—The dynamo output needed.
3—The dynamo speed and the method of driving the dynamo.
4—The proper size storage battery to be used with the dynamo selected.
5—The type of wiring.

The most important of these is the first, that is, what lamps to use.

After determining the lamps to be used we immediately know the amperes taken by these lamps, and from this the other points can be readily deduced.

There are only three size bulks now in general use for headlight work, these being respectively 16, 21 and 25-candle power. For small motor cars which travel at comparatively slow speed, and where the owners would be satisfied with light that, while better than acetylene lights usually supplied with these small cars, is still not the most powerful, and where he will not be liable to compare his lights with those of friends who have higher power to the detriment of the 16-candle power lamps, 16-candle power is undoubtedly ample. On the higher-powered cars the 21-candle power bulbs are almost in universal use today. These will give ample light for driving up to a speed of 40 miles an hour at night, illuminating the road far enough ahead so that any object may be observed in time to stop almost as well as in the daylight, and in fact gives all the light that is needed.

Lighting the Road

Such lamps when used with a shallow parabolic reflector will light a road 50 feet wide for the full width of the road from the front of the car to a point over one-quartermile away. A deep parabola of the same focus will light the road even further, but will not give as much light at the sides close to the car. Where extremely high-powered cars are used running at very high speed and where very large reflectors can be used, 25-candle power bulbs are sometimes used.

It must be realized that with small reflectors built to take a 16-candle power bulb, the insertion of a 21-candle power bulb will not give the proportionate larger amount of light on the road that 21 is to 16, and similarly a 25-candle power bulb in a reflector built for 21-candle power will not give sufficient additional light to warrant its use.

The reflector should be adapted for the particular size bulb to be used, and for this reason there is little use in using large candle power bulbs in small reflectors.

With a commercial reflector having the greatest diameter of 8 inches, a 16-candle power bulb is about all that can be economically focused. With one of 10 inches diameter a 21-candle power bulb should be used, and there is little use in using a bulb larger than 21-candle power unless you have a 12-inch reflector, which is very seldom seen on account of the large size.

Choosing the Bulbs

We can therefore safely assume that the bulbs to be chosen for the headlights will be of 21-candle power, these being almost universal for cars of over 25-horse power today.

The side lamps and rear lamps are signal lamps only, and for these bulbs of small candlepower can be used. Four candlepower or 2-candlepower bulbs are adequate, and it is customary to use 4-candlepower side lights, and 2-candlepower rear lights. The amount of current taken by these side and rear lights is so small that there is no objection to using 4-candlepower bulbs for all three, or 2-candlepower for all three, but the desirability to have a brilliant light at the side, for appearance, has led to the use of 4-candlepower bulbs. Frosting these bulbs in the side lights gives a very pleasing appearance and I think will be very largely adopted in the near future.

In addition to the heads, sides and rear, the car will probably be equipped with such current-consuming devices as a speedometer light and electric horn, very possibly a cigar lighter, in the tonneau or limousine, and similar lights. None of these lights, however, is used for a very long period of time, and in designing the balance of the system after having decided on the five main lamps it may be safely assumed that the overload capacity of the outfit will take care of these additional loads which are run for a short time only.

We have therefore assumed that the lamp load on an ordinary car should be: two 21-candlepower headlights, two 4-candlepower side lights and a 2-candlepower rear light. The two headlights will take 7 amperes, the two side lights 1-7 ampere, the rear light .6 ampere, making a total lighting load of 9.3 amperes.

The second point we have to determine is the dynamo output needed: We have already assumed the light load to be 9.3 amperes. In order to make sure that we have ample overload capacity to take care of the many short loads made by the horn, speedometer, light, etc., the dynamo should be capable of delivering to the storage battery, slightly more amperes than is required by the lamp load. For this reason an ampere output of 10 amperes of the dynamo has been universally accepted as the proper amount when such a lighting equipment is used. This will keep the storage battery always up to the best efficiency, and at the same time it is small enough, so that the storage battery will not have to have too large plates in order to run without undue deterioration.

Gearing of the Dynamo

The dynamo should be so geared to the car, as to give its full output at from 15 to 18 miles an hour, and any speed above this. At a speed lower than 15 to 18 miles an hour, the car will not be driven for more than a very few miles with all the lights lighted, and the reserve capacity of the storage battery will more than make up for this short time. Of course when the car is being driven in the city where the headlights are not being used, it often runs slower than this speed, but at these lower speeds the dynamo is generating a proportionately smaller amount and will give ample current to take care of the two sides and the rear lamp, which takes only a total of about 2.3 amperes.

A shunt-wound dynamo which will deliver 10 amperes at 15 miles an hour, will deliver 2.3 amperes at 8 to 9 miles an hour, so that whenever the car is running it will supply ample current for the side and rear lamps.

We have now decided that the lamps to be used continually will be two 21-candlepower heads, two 4-candlepower side lights and a 2-candlepower rear lamp. Also for this we will need a dynamo of 10 amperes at from 15 to 18 miles an hour. The next point is at what speed of the dynamo should we get 10 amperes output, or, in other words, what shall be the ratio of speed between the dynamo and the engine, and what shall be the method of driving the dynamo.

These two points are so inter-related that they should logically be considered together. The size, weight, and consequently cost of the dynamo, is determined not only by the ampere capacity but also the speed at which the dynamo will deliver this 10 amperes capacity into a 6-volt three-cell lead battery. I will not enter into discussion as to the relative size, weight and cost of shunt series compound or magneto type dynamos, and limit my statements to the fact that in dynamos of any one type, the size, weight and cost is determined by the ampere capacity and the speed at which this number of amperes can be put into a three-cell lead battery.

The cost of a dynamo which will deliver 6 volts and 10 amperes at 1,500 revolutions per minute is 30 per cent less than one which gives the same output at 1,000 revolutions per minute, and it is less than half the cost, and of half the weight of one designed for the same output at 500 revolutions per minute.

A shunt-wound dynamo designed to put 10 amperes into a three-cell battery at 1,000 revolutions, weighs approximately 21 pounds and can be made approximately 8 inches long by 5⅝ inches high by 4¾ inches wide. If we reduce this speed to 500 revolutions the weight becomes approximately 33 pounds, and the dimensions approximately 9¼ inches by 7½ inches by 4¾ inches.

Speed Required for Dynamo

This 1,000-revolution dynamo should be run at about twice engine speed for the best results, and the 500-revolution dynamo should be run at engine speed for the best results. The question immediately comes up as a matter of judgment, whether there is sufficient advantage in running at the slower speed to make up for the added weight and the added cost.

It will be found in general that where a shaft is provided on the engine to which the dynamo can be coupled, and this shaft runs at engine speed, the added weight and cost of the engine-speed dynamo is warranted, because it eliminates the cost and complication of sprockets and chain for driving the dynamo. But where such a shaft would have to be put specially in the engine, and driven by gears, or when some shaft already projecting runs at engine speed, but is not so located that the dynamo could be directly coupled to it, and consequently either gears, or sprockets and chain have to be used, there is little question but that a dynamo delivering its full output at 1,000 revolutions per minute and running at about twice engine speed, is the happy means in the weight cost and size. A dynamo which

for steam cars, and in these respective departments spare parts are carried for every model manufactured since the company entered the motor vehicle field. To care for a stock department of this capacity calls for a force of eight men, divided as follows: Two for supplying the repair department with spare parts; one for the sale of parts to customers who do not bring their cars to the building for repairs; one shipping clerk, one receiving clerk, and two stock clerks who care for the details connected with replenishing supplies.

The stock is carried on two floors, part on the ground floor, Fig. 5, and part on the mezzanine shown in Fig. 3. The space on either floor is a long oblong with shelves arranged crosswise, with an aisle extending from end to end along one side. Fig. 9 gives a general conception of the excellent light along one side, the wide aisle and the shelving arrangement.

The private office of the manager is so located as to be accessible to the garage, to the repair shop and to the bookkeeper's department. This is imperative in such an organization. Leading from the bookkeeper's office is a staircase to a huge vault on the mezzanine floor in which all records are kept, as well as the books of the company.

The heating system used is a low pressure steam one, with a pressure of 5 pounds sufficing. Continuous coils of pipes are distributed around the walls, as may be seen in many of the illustrations.

A valuable feature in a building of this kind is the watchman's signal system, which is in the hands of one of the large metropolitan organizations for this work. Throughout the building are located five signal boxes in which the watchman must check up once every hour during the night, each time he checks it is registered on a tape in the central office of the surety company, which may be miles from the building. In case the watchman fails to make his regulation report a special officer is sent from headquarters to make investigation.

System Should Do for the Motorists

Electric Outfit Consisting of Two 21-Candlepower Headlights, Two 4-Candlepower Sidelights and One 2-Candlepower Taillight Will Supply Light Sufficient for Car

will put 10 amperes into a three-cell battery at 1,000 revolutions, driven at twice engine speed on a car with 36-inch wheels, geared 3½-to-1 on the back axle, will start to charge the battery at from 6 to 7 miles an hour, and will give enough current to supply all the lamps, that is, about 10 amperes, at 15 miles per hour.

The same dynamo on a car geared 3-to-1 with 36-inch wheels, starts to charge the battery at 9 miles per hour, and will deliver enough current to take care of all the lamps at 18 miles per hour. Such a dynamo I believe to be the ideal one where there is no provision made for driving directly at engine speed.

A machine running at higher speed than this has not sufficient advantage in less weight, and cost, to warrant the higher speed of the chain and the higher speed in revolutions per minute of the armature, and to warrant the additional wear on the bearings, and additional chance for noise. At the same time the use of a dynamo at less than twice engine speed to get a reduction in chain speed and wear on the bearings, has not sufficient advantage to warrant the use of a larger, heavier dynamo, running at say engine speed and driven by chain, or gears.

On a dynamo driven by ⅜-inch pitch silent chain at twice engine speed, sprockets of 30 and 15 teeth would be used. At 45 miles per hour this chain would run at 1,500 lineal feet per minute and at 60 miles per hour, at 2,000 feet per minute. This is not an excessive speed, but if a dynamo giving its output at 1.500 revolutions per minute were used running at three times engine speed, we would use forty-five and fifteen tooth sprockets and the chain speed becomes 2,250 feet per minute at 45 miles per hour, and 3,000 at 60 miles per hour, which is too high for efficiency or long life. We may therefore decide not to run our dynamo at over twice engine speed.

On the other hand where it is possible to drive at engine speed through an Oldham coupling, the ideal case is undoubtedly reached, and in this case the additional weight and cost of the dynamo is warranted, as we save the additional cost of sprockets and chain and eliminate the necessity of oiling these, etc.

Having determined the lights to be used, the dynamo output, and the relative speed of the dynamo, to the car, the next point to determine is the method of driving the dynamo. A very useful method of driving the dynamo is to extend the pump shaft through the pump, leaving an extension back of the pump to which the dynamo can be directly coupled by means of an Oldham coupling.

Method of Driving Dynamo

In other cases it is possible to have the armature shaft of the dynamo extend through both ends and drive from the timing gears through the dynamo armature to the magneto, having the magneto and the dynamo lined up in tandem. In each of these cases a dynamo running at engine speed is used for the four-cylinder car, and 1½ time engine speed for a six-cylinder machine.

When neither of these methods is possible, and it becomes necessary to drive the dynamo by gears or silent chain, we will then use the higher speed machine, running at about twice engine speed, and this can be driven in a number of different ways.

Where the pump is driven separately from the magneto, it may be driven at twice engine speed and the dynamo can be run directly from the pump shaft through an Oldham coupling. Where a shaft running at twice engine speed can be installed projecting from the timing gearcase, or from the gearbox, it can be driven by gears or chain running in oil, and then the dynamo can be directly coupled to the shaft. This gives a noiseless and almost wearless drive.

A sprocket on the pumpshaft or magneto-shaft driving a sprocket on the dynamo by silent chain at twice engine speed, is quiet, efficient and satisfactory. It is of course better if the chain can be enclosed and run in oil. Any one of these methods has been proven to be entirely satisfactory in practice and have long life, and to be quiet.

The first thing to determine is, the proper size storage battery to use with the dynamo selected. A proper storage battery must fulfill two conditions:

Proper Storage Battery

A. If the car owner runs entirely in the day time the battery must have sufficient square inches of plate surface to be charged whenever the engine is running at the maximum dynamo amperes without injury to the battery.

B. If the car is standing still with all lights lighted, the battery capacity should be sufficient to keep all the lights burning for 6 hours, and when only the side and rear lights are on, it should be capable of keeping these lighted for say two nights, or 24 hours.

Considering A, experiment shows that a battery having 160 square inches of positive plate surface and 200 square inches of negative plate surface, will not be injured by use with a dynamo giving 10 amperes output on an engine. Such a battery would undoubtedly be ruined if 10 amperes were put into it continually on the test bench, but the conditions in motor car service are so different as to require some comment.

There are two things that cause rapid deterioration of storage batteries when they are charged continuously at high rate. The first is that the heating of the battery due to continuous charging, softens the plates so that they become readily disintegrated. The second is that large bubbles of gas form on the negative plates, and when these bubbles break away from the plates, they take particles of the active material, especially when this has become softened due to heating.

On motor car work, in the first place, it is very seldom that a battery is charged continuously at the maximum rate for more than 2 hours at a time. There are always stretches of a few minutes when the engine is slowed down, so that the dynamo does not deliver its full output, or when the engine is stopped entirely, and the battery has a chance to cool off. As a result the service is not at all analogous to tests made on a test bench where the current is put into the battery continuously. On a test bench the battery would get hot but on a car it will not.

In fact in a battery with the plate surface already decided, there is little or no heating in ordinary service, and no excessive heating in the most severe service.

In the second place the large air bubbles do not have a chance to form on motor car batteries due to the jarring and jolting that a motor car gets in going over the road. Before the bubbles have time to become large enough for them to take off a serious amount of active material when they break away, they are jolted loose and do not injure the plates to any material degree. As a result it will be found that storage batteries can be run at almost double the charging rate without undue deterioration on a motor car, that they can when standing still on a bench.

Mechanical Agitator Eliminated

The mechanical agitator now often used for large stationary batteries to keep bubbles from forming, is replaced by the jolting of a motor car, and the various methods of cooling often adopted for large stationary plants, is taken care of in this case, by the occasional slowing down of the engine and occasional stopping of the engine.

A battery having the plate surface mentioned above will light all the lamps, that is, discharge of a 9½ to 10 ampere rate for about 3¼ hours, and will light the side and rear lamps for 24 hours. Such a battery does not light all the lamps long enough, so that if batteries of this size are used there should be two of them, or a larger capacity battery, having at least 80-ampere hour capacity at a 10-hour rate, can be used. Any battery made by a reputable maker and having 80-ampere hour capacity at a 10-hour discharge rate, will fulfill all requirements. This latter battery will fulfill all the specifications and has ample plate surface, ample capacity to run all lamps for at least 6 hours, and the side and rear lamps for 24 hours.

Having determined the size and best method of operating our lamps, dynamo and batteries for any particular installation, the next point that becomes of interest is the method of wiring. The use of a bayonet lock socket has now become universal for practically all connection plugs and all lamp plugs, so that there is little need of discussing this. One point, however, that is not entirely cleared up in a great many people's minds, is the type of wire which should be used for motor car work. In making a recommendation to a special advisory committee of one of the standardization committees of the Society of Automobile Engineers, I recommended that the cable to be used for motor cars, must stand a test of 12 hours immersion in oil, 12 hours immersion in gasolene, and 12 hours immersion in water, and then stand 500 volts applied between the two conductors, without breakdown.

Wherever there is any abrasion the cable should be armored either by a light woven metallic armor, or by conduit, loom or some similar material.

There is no use armoring against heavy abrasion such as might be gotten by the wire rubbing against the flywheel, as any armor will wear through rapidly in this case, but the armor should take care of the abrasion that occurs on the leads of the lamps as they swing against the frame or some similar part, and almost any of the woven metallic armors will do for this purpose.

Wherever rubber or material that would be dissolved by gasoline or oil, is used for insulation, it should be protected by another covering impervious to oil or gasoline, so as to render it impossible for the insulation to be ruined.

From the

PAST AND PRESENT ON ST. LOUISANS' TOUR OF ARCADIA HIGHWAY

CANADIANS Incorporate—Incorporation under the companies act has been granted to the Canadian Automobile Association, with a capital of $50,000.

Club Buys a Tractor—The Peabody Automobile Club, of Peabody, Kans., has inaugurated a new feature in putting at work a 45-horsepower tractor engine, improving the roads on the route of the new Santa Fe trail through that section. Leading citizens are superintending the work and pledging funds.

Cuba Has Good Roads Club—Asociación de Buenos Caminos is the official name of the good roads organization in Cuba. This association, which was formed recently, is composed largely of motor car owners. The object of the organization is to increase the good roads mileage and to prepare and publish maps showing the routes available for motor tours on the island at the present time.

Discuss New York Roads—At the regular monthly meeting of the Albany Automobile Club of Albany, N. Y., an address on good roads was delivered by Frank D. Lyon of Binghamton, the new secretary of the New York State Automobile Association. After the meeting Chairman W. L. Oppenheim of the good roads committee declared that he, together with the members of the committee, would urge the mayor to give consideration immediately to the roads through Albany connecting with the main highways. The condition also of the Albany to Troy road was declared as deplorable.

Motor Car in Politics—In Texas, Colonel J. F. Wolters, candidate for the United States senate to succeed Senator J. W. Bailey, is making a notable record of motor car mileage. In the first 35 days of his canvass of that state he traveled 2,460 miles in his car and 400 miles by rail. On his long motor car trips through the western part of that state he met with some interesting experiences. He expects to travel not less than 9,000 miles by motor car before he winds up his present campaign. Governor O. B. Colquitt, who is seeking renomination, and his opponent, W. F. Ramsey, are both making a motor car canvass of Texas.

Canadian Club Elects—Good roads and many things having a bearing on their construction and maintenance were discussed at length at the eighth annual meeting of the Automobile Club of Canada held May 10. F. H. Anson was reelected to the presidency. The other officers are as follows: L. C. Rivard, secretary; G. A. McNamee, treasurer; Eugene Tarte, Arthur Berthiaume, A. L. Caron, J. H. Sherrard, D. McDonald, G. R. Smith, L. E. Geoffrion, H. W. Pillow, F. H. Anson and L. C. Rivard, directors. The president in his review of the work done reported that work had been commenced on the King Edward highway to the border to connect with the state roads, to be 40 miles in length. Another to Chambly will be 17 miles long and the club has movements on foot for the building of several other highways.

Outing for Syracuse Dealers—The Syracuse Automobile Dealers' Association will have an outing in June, time and place to be decided later. The annual outing was held last year at Mexico Point.

Clubs Starting Touring Bureaus—The Automobile Club of Buffalo has perfected its touring information bureau in the Lafayette hotel. Maps in the bureau are available showing the important routes through New York state, indicating the principal connections in the adjoining states and Canada. Last week Albany, N. Y., established a touring bureau and the Troy Automobile Club will open one soon in the Renssalaer hotel, Troy.

Louisiana Road Work—Floods in limited areas of Louisiana have caused the suspension of some work inaugurated by the good roads organization, but in most of the parishes the work is continuing actively. At Crowley $750,000 has been made available for road improvement by the sale of a bond issue. An election at Rayne has authorized a special tax for road improvement. Twenty miles of surfaced roadway are to be opened in Lafourche parish this week. Better roads will be the principal aim of the Avoyelles Automobile Club.

County Tour Arranged—With the slogan "Know your own county," and with a civil engineer working now on a road map, Fulton county, Ga., in which Atlanta is located, is planning a round-the-county tour. It is the scheme to make this a 1-day run, about 150 miles in length, to cover all or at least a material part of every good paved road in the county. It is the belief of the county commissioners that few of the motorists know even half the good roads in Fulton county, and with this belief in mind they have started work on mapping out a 150-mile route in Fulton county that will be suitable for a 1-day run. It is likely that July 4 will be selected as the date of the event.

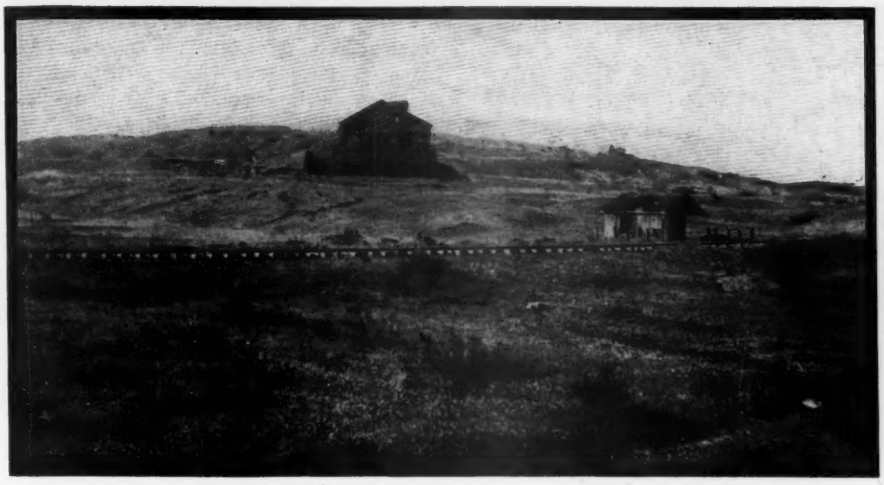
Would Blaze Glidden Trail—The Flanders Mfg. Co. has offered the services of a Flanders electric to the American Automobile Association to lay out the Glidden tour route.

New Canadian Club—The Niagara Frontier Automobile Club, of Niagara Falls, Ont., has been formed with the election of the following officers: President, Dr. F. W. Wilson; vice-president, D. A. Coate; secretary-treasurer, H. R. Wood; executive committee, Dr. W. W. Thompson, C. B. Woodworth, J. E. P. Rothwell. An active campaign for construction of good roads will be started at once by the motor organization.

Wisconsin Registrations—The Wisconsin motor car registration on May 10 was 17,250, indicating that 17,250 cars are being operated in Wisconsin at this time. It was expected that the registration under the new annual registration law would reach 23,000 immediately after January 1, when all cars must be re-registered. However, applications for licenses are coming in at the rate of 175 per day and that figure will be reached soon. The total income to the state on licenses to May 10 was $86,250.

Buffalo Opens Country House—The Automobile Club of Buffalo opened its $75,000 country club house at Clarence, N. Y., 17 miles east of Buffalo, on Saturday, for the season. In addition to its club house the club has 70 acres of land graced with beautiful groves and orchards and a lake of pure, sparkling water. Members of clubs outside a radius of 100 miles of Buffalo will be extended the courtesies of the club house upon presentation of their 1912 membership cards to the superintendent of the country club house. The Automobile Club of Buffalo has a member

Four Winds



IRON MOUNTAIN, MO., ON ARCADIA TRAIL NOW A ONE-HOUSE TOWN

ship in excess of 3,200. Its headquarters in Buffalo are located at the Lafayette hotel.

Track Meet for Baltimore—Motor car races will be held on the Laurel race track, Baltimore, Md., on June 25. R. E. Sladel has closed a contract with H. D. Brown, owner of the track, for this purpose.

Size of New York Clubs—Statistics just compiled by the New York State Automobile Association indicate there are now 3,243 members in the Buffalo Automobile Club; 1,566 in Rochester, with other important clubs as follows: Long Island, 658; Utica, 401; Albany, 271; Cortland, 263; Elmira, 173; Poughkeepsie, 168; Binghamton, 149; Hornell, 134.

Fees Remain the Same—There will be no change in the fee charged for motor cars and motor cycles entering Mt. Tacoma National park this season, according to Edward S. Hall, superintendent of the great scenic park. Five dollars will be the tariff on motor cars, while $1 will be charged on each motor cycle entering the grounds. Although the revenues do not keep pace with the expenditures necessary to the operation of the park, Superintendent Hall desires to keep the fee at the old rate to encourage visits to nature's wonderland.

Arcadia Highway Inspected—An inspection trip of the Arcadia highway was made last week by a party of St. Louis motorists. They found the road in great condition for the dedication, May 23. A year ago parts of the road were well nigh impassable. The road passes through many interesting spots, including Fort Davidson, where General Price had his Confederate troops during the early part of the civil war; Graniteville and Iron Mountain, the city that gave the railroad its name. This city is now one hut which is falling to pieces. At the Arcadia Country Club, one terminus of the road, the party had a great reception. The highway was found to be 104 miles long and makes an ideal tour for St. Louisans.

Teaching Road Building—An important experiment in road building is now being made in Danville, Quebec. The Quebec government has caused the selection of twenty-five men from different sections of the province to go to Danville and learn the practical end of road-making. The idea is that when these men have learned how to successfully make roads, they will return to the municipalities from which they came, and teach others.

Washington Sociability Postponed—The sociability run of the Automobile Club of Washington has been postponed from May 18 to May 25. The club has applied for a sanction for a 3 days' reliability run in June and it is probable the contest will be run June 11, 12 and 13. It will be run under grade 4 rules with the addition of the outdoor tests. The pathfinding car, a Cole, will leave June 2 to lay out the route, which embraces Maryland and Pennsylvania. The night stops will be in Harrisburg and Philadelphia. The club has been assured of at least twenty-five entries.

Rough Trip Through the Mountains—E. C. Hill, of Spokane, Wash., recently returned from a 648-mile trip in an Everitt to Sheridan, Mont. His was the first car through the mountains this year and the trip was made 2 months earlier than any machine has ever made the trip before. The route led over four mountain divides, including the Rockies, and 100 miles was through snow and mud, necessitating the use of low gear for a great portion of the distance. The car forded 106 running streams and the timber line was crossed four times. The roads for the 139 miles between Heron and Thompson Falls were in miserable condition and from Heron to Belknap no vehicle had been over the roads since last December. Mr. Hill reports that the roads near Missoula, Mont., are in excellent condition, due to the work done on them by convict labor.

First Post Driven—Many public officials of British Columbia cities were present when the first post marking the Canadian highway was planted on May 4 on the bank of the Alberni canal near the town of Alberni, B. C.

Ready for the Summer Boarder—Heron Lake, Minn., a city of 803 population, furnished seventy-eight applications for state licenses as chauffeurs. The fact that one-tenth the population want licenses is said to be due to the fact that the place is a summer resort.

Medina Chooses Whipple—At the annual meeting of the Medina Automobile Club, of Medina, N. Y., the following officers were elected for the ensuing year: President, F. H. Whipple; vice-presidents, C. H. Howell, Edgar Knapp and Burrie Beecher; secretary and treasurer, H. W. Robbins.

Outdoor Show at Lancaster—Plans are being made for a motor car and horse show to be held on the fair grounds at Lancaster, Pa., June 4, 5 and 6. Motorists from York, Harrisburg, Reading and Palmyra will attend individually or in a sociability run. The club having the largest number of cars registered during the 3 days will be awarded a large silver trophy.

California Registrations—Californians, according to statistics, have the motor habit. Registrations at Secretary of State Jordan's office show Californians have purchased on an average of 107 cars per day during the past month. During April 2,803 cars were sold in the state. The fees for the registration of the machines amounted to more than $6,000.

Club Changes Name—At a meeting of the members of the Hood River Automobile Association the name of that organization was changed to that of the Hood River Good Roads Association. The following board of directors for the year were elected: E. O. Blanchard, Charles Hall, P. S. Davidson, Captain C. P. McCan and J. R. Putnam. E. O. Blanchard, mayor of Hood River, Ore., was made president and P. S. Davidson secretary.

Going on Long Tour—To demonstrate the endurance of a Packard six-cylinder car and for the purpose of advertising the resources of Louisiana, J. C. Reeves, of New Orleans, will circle the United States. He will leave May 16 for Shreveport, La., thence to Denver and then to San Francisco. His route then will lay along the coast to Vancouver. From Vancouver the line of the Canadian Pacific will be followed to Montreal, after which the itinerary provides for a detour through New England and a short stop in New York. The last lap of the long trip will be made along the Atlantic and gulf coasts. The journey will require 11 months, it is calculated.

Current Motor Car Patents

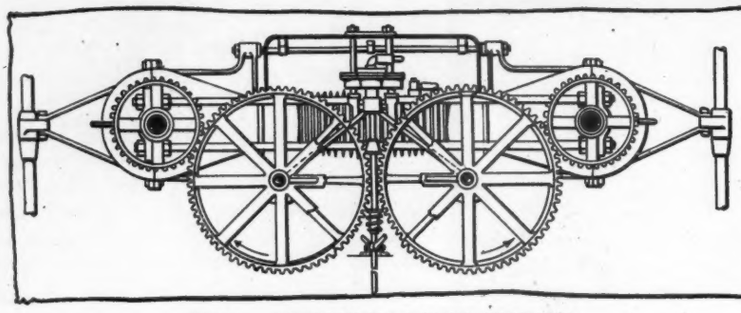


FIG. 1—OSTERGREN MOTOR STARTER

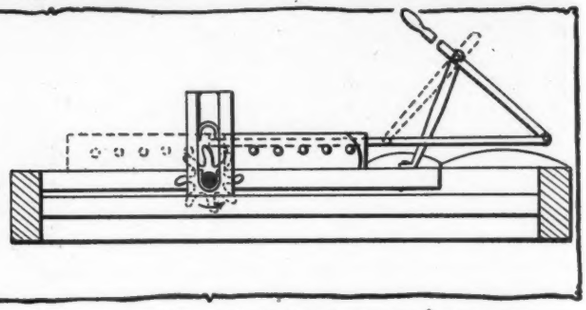


FIG. 2—WEAVER & KIMMER MOTOR STARTER

PATENTS ISSUED MAY 7, 1912

1,025,115—Brake Mechanism. James T. Bishop, Saltillo, Mass. Filed February 27, 1911. Serial No. 611,010.

1,025,117—Rotary Internal Combustion Engine. Oram A. Boyer, Milwaukee, Wis. Filed February 7, 1911. Serial No. 607,132.

1,025,159—Chain Guard for Vehicle Wheels. Conness T. Raymond, Chicago, Ill., assignor of one-half to John W. Pax, Chicago, Ill. Filed January 18, 1909. Serial No. 472,834.

1,025,180—Lever-Locking Device. William B. Wreford, Detroit, Mich. Filed December 13, 1910. Serial No. 597,038.

1,025,187—Motor Vehicle. Russell Huff, Detroit, Mich., assignor by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed August 28, 1907. Serial No. 390,494.

1,025,188—Gearing for Motor Vehicles. William D. Hughs, Atlanta, Ga. Filed March 15, 1911. Serial No. 614,715.

1,025,201—Railway Motor Car. Stanley V. Meigs, Pueblo, Colo. Filed September 1, 1911. Serial No. 647,196.

1,025,202—Eye Shield for Spectacles, Eye Glasses, and the Like. Gustave Moritz, St. Louis, Mo. Filed June 17, 1910. Serial No. 567,512.

1,025,209—Elastic Vehicle Wheel. Frank I. Sears, Oakland, Cal. Filed December 5, 1910. Serial No. 595,571.

1,025,211—Pump. John H. Sims, Cimarron, N. Mex. Filed May 18, 1911. Serial No. 627,967. Renewed March 22, 1912. Serial No. 685,414.

1,025,215—Universal Jointed Motor Car Steering Rod. Jacob H. Stull, Fremont, Ohio. Filed October 31, 1910. Serial No. 589,852.

1,025,216—Lever Control for Motor Vehicles. Alfred T. Sturt, Flint, Mich., assignor to Buick Motor Co., Flint, Mich., a corporation of Michigan. Filed September 1, 1911. Serial No. 647,199.

1,025,232—Spark Plug for Internal Combustion Engines. Vincent G. Apple, Dayton, O. Filed August 3, 1906. Serial No. 329,031.

1,025,233—Spring for Vehicles. Herbert Austin Barnt Green, near Birmingham, England. Filed April 14, 1909. Serial No. 489,780.

1,025,251—Engine Cooling Device. John Desmond, Chicago, Ill., assignor to William S. Potwin, Chicago, Ill. Filed August 8, 1910. Serial No. 576,035.

1,025,295—Starting Mechanism for Internal Combustion Engines. Oscar P. Ostergren, Brooklyn, N. Y., assignor, by direct and mesne assignments, of one-half to Harry Reis and one-half to Samuel S. Marley, Wilmington, Del. Filed March 7, 1911. Serial No. 612,807.

1,025,315—Fluid Spring for Vehicles. Frank Schreidt, Mansfield, Ohio. Filed February 20, 1911. Serial No. 609,842.

1,025,331—Power Transmission Mechanism. Clarence W. Taylor, Chicago, Ill. Filed April 24, 1911. Serial No. 622,995.

1,025,332—Power Transmission Mechanism. Clarence W. Taylor, Chicago, Ill. Filed July 25, 1911. Serial No. 640,514.

1,025,342—Tachometer. Curtis Hussey Veeder, Hartford, Conn., assignor to The Veeder Mfg. Co., Hartford, Conn., a corporation of Connecticut. Filed May 3, 1911. Serial No. 624,874.

1,025,343—Spring Wheel. Horace Villiers-Stuart, Louisville, Ky. Filed October 8, 1909. Serial No. 521,767.

1,025,344—Starting Device for Engines. James A. Walker, Rockford, Ill. Filed July 19, 1911. Serial No. 639,405.

1,025,352—Acytelene Gas Generator. Francis H. White, Maghull, Liverpool, England, assignor of one-half to Oliver Huntley White, Liverpool, England. Filed July 25, 1910. Serial No. 573,680.

1,025,357—Automatic Electric Cut Out Switch. Robert Winterhalder, Kamloops, B. C., Canada. Filed February 3, 1910. Serial No. 541,799.

1,025,361—Rotary Explosion Motor. Frederic Beck. Neuilly-sur-Seine, France. Filed October 10, 1911. Serial No. 653,791.

1,025,387—Motor Car Controller. Otto Euler, Jackson, Mich. Filed January 26, 1911. Serial No. 604,743.

1,025,388—Shock Absorber for Vehicles. Highland T. Finnell and Ernest Schernikow, New York, N. Y. Filed December 3, 1910. Serial No. 595,519.

1,025,398—Motor Car Indicator. John Hoaker and William Banks, San Antonio, Texas. Filed November 3, 1910. Serial No. 590,461.

1,025,404—Acetylene Gas Generator. James S. Johnson, Le Roy, Kans. Filed January 19, 1912. Serial No. 672,110.

1,025,432—Steering Mechanism. Albert Theerman, Dike, Iowa. Filed October 20, 1911. Serial No. 655,779.

1,025,433—Spring Wheel. Carl C. Thomas, Madison, Wis Filed December 3, 1909. Serial No. 531,128.

1,025,438—Mold for Casting Circular Objects. Thomas D. West, Cleveland, Ohio. Filed February 20, 1911. Serial No. 609,593. Renewed October 18, 1911. Serial No. 655,593.

1,025,439—Internal Combustion Engine. Harry Whidbourne, Plymouth, and John James Lishman, Salcombe, England. Filed August 24, 1911. Serial No. 645,819.

1,025,481—Fluid Clutch. Thomas F. Rainsford, Cleveland, Ohio. Filed June 1, 1910. Serial No. 564,479.

1,025,483—Vehicle Wheel. Thomas Rhodus, Chicago, Ill. Filed February 18, 1911. Serial No. 609,510.

1,025,496—Starting Mechanism for Motor Car Engine. Edgar La Motte Weaver and Edward Craveling Kimmel, Saltillo, Pa. Filed April 5, 1911. Serial No. 619,129.

1,025,510—Method of Lubricating Bearings. James F. Craven, Pittsburgh, Pa., assignor to Craven Engineering Co., Pittsburgh, Pa., a corporation of Pennsylvania. Filed February 5, 1910. Serial No. 542,290.

1,025,528—Demountable Rim. Richard E. Jeffery, Piedmont, Cal. Filed March 29, 1911. Serial No. 617,677.

1,025,532—Protective Device for Electrical Apparatus. Ray H. Manson, Elyria, Ohio, assignor to Dean Electrical Co., Elyria, O., a corporation of Ohio. Filed June 15, 1910. Serial No. 566,902.

1,025,543—Hydrometer for Storage Batteries. Edward W. Smith, Philadelphia, Pa. Filed June 23, 1910. Serial No. 568,450.

1,025,553—Carbureter. Charles O. Williams, St. Louis, Mo., assignor to Fred E. Arnold, Ionia, Mich. Filed July 29, 1911. Serial No. 641,289.

1,025,555—Wheel. Ora W. Williams, Minneapolis, Minn., assignor of one-half to W. H. Gardner, Minneapolis, Minn. Filed February 24, 1908. Serial No. 417,254.

1,025,566—Breaker Box for Ignition Systems. William J. Hart, Mount Vernon, N. Y., assignor to C. F. Splitdorf, New York, N. Y., a corporation of New York. Filed June 6, 1910. Serial No. 565,264.

1,025,573—Terminal Clip. Vernet H. Keller, Hatfield, Mass. Filed October 3, 1911. Serial No. 652,582.

1,025,591—Vehicle Wheel. Charles B. Ross, Greenleaf, Kans. Filed October 17, 1910. Serial No. 587,411.

1,025,602—Derigible Motor Car Lamps. Thomas G. Wilbraham, Alloway, N. J. Filed January 6, 1912. Serial No. 669,849.

1,025,604—Steering Mechanism. Gustaf Arvid Anderson, Waynesboro, Pa., assignor to The Geiser Mfg. Co., Waynesboro, Pa. Filed March 22, 1911. Serial No. 616,275.

1,025,605—Oscillating Cylinder Engine. Gustaf Arvid Anderson, Waynesboro, Pa., assignor to The Geiser Mfg. Co., Waynesboro, Pa. Filed March 25, 1911. Serial No. 616,919.

1,025,610—Pneumatic Tire for Vehicle Wheels. Georges Desson, Paris, France. Filed June 21, 1911. Serial No. 634,631.

1,025,648—Acetylene Gas Generator. Edwin M. Rosenbluth, Philadelphia, Pa. Filed July 19, 1909. Serial No. 508,369.

1,025,723—Acetylene Gas Generator. Clinton Shafer, Upper Sandusky, Ohio. Filed September 6, 1910. Serial No. 580,611.

1,025,728—Center Device. Frank Lafyett Wheeling and Frederick Arthur Rogers, Los Angeles, Cal. Filed September 21, 1911. Serial No. 650,513.

1,025,734—Vehicle Tire. John F. Bosquett, Jersey City, N. J. Filed April 11, 1911. Serial No. 620,311.

1,025,782—Carbureter. Henry Lowe Brownback, Norristown, Pa. Filed December 13, 1910. Serial No. 597,131.

1,025,790—Wheel. Enan M. Deal, Philadelphia, Pa., assignor to Edward A. Schneider, Philadelphia, Pa. Filed September 22, 1909. Serial No. 518,932. Renewed January 18, 1912. Serial No. 671,885.

1,025,804—Motor Car Transmission Mechanism. Orion B. Hitchcock, Arthur M. Berggren and Fred M. Berggren, Morganville, Kans. Filed December 27, 1910. Serial No. 599,351.

1,025,816—Carbureter. Jacob Matthias Lofthouse and Emily Rosalie Booty, Perth, Western Australia. Filed April 10, 1911. Serial No. 620,152.

1,025,844—Ignition for Internal Combustion Engines. Claude L. Terry, Elyria, Ohio. Filed March 4, 1910. Serial No. 547,339.

1,025,854—Motor Car Tire. Leon Clifford Beaumont, Hudson Falls, N. Y. Filed November 13, 1911. Serial No. 660,011.

1,025,869—Thermodynamic Motor. Lewis A. Haines, Columbus, Ohio. Filed February 25, 1910. Serial No. 545,818.

1,025,896—Attachment for Electric Lights. Justus Cornelis Zubli and Abraham Vles, Seattle, Wash. Filed August 2, 1909. Serial No. 510,917.

TAYLOR Differential Mechanism—No. 1,025,332, dated May 7; to Clarence W. Taylor, Chicago, Ill.—This patent relates to a differential power transmission mechanism such as now is employed in motor car jackshafts and rear-axles, but which, unlike the mechanisms now most generally employed, permits one wheel to run faster than the other as required in rounding curves, and still transmits power equally to both wheels regardless of traction when the vehicle moves in a straight line. As illustrated in Fig. 3 the inner ends of the transverse driving shafts are loosely journaled in the hub of the large bevel driving gear. Keyed to each of these shafts, on either side of the large bevel gear, is a disk with two friction plates on

either side. These friction plates are secured by a series of draw-connectors to the hub of the large bevel driving gear. Thus when the large bevel gear rotates, the friction plates are clamped against the friction disks connected to the driving shafts, and these are connected directly or indirectly to the driving wheels of the vehicle. If one wheel runs faster than the other the friction plates automatically release and all the power from the driving gear is transmitted to the slower wheel.

Internal Combustion Engine—No. 1,025,439, dated May 7; to Harry Whidbourne, Plymouth, and John James Lishman, Salcombe, England—The engine design covered by this patent is shown in Fig. 4 and is of a two-cycle type with double diameter cylinders and pistons. The upper portion of the cylinders comprise the working cylinders and the lower annular portions the charging chambers. The charging chambers are divided into two compartments by fixed sleeves that extend up from the base of the cylinders. Means are provided for supplying air to one of these compartments; and for supplying gas to the other compartments. There are conduits cross-connecting the air compartment in the annular chamber of one cylinder and the gas compartment in the annular chamber of the other cylinder, and connections between the cross-connecting conduits and the cylindrical working chambers, each cross-connecting conduit being so partitioned and constructed that a charge of gas is drawn at one end and a charge of air at the other.

Motor Car Engine Starter—No. 1,025,496, dated May 7; to Edgar La Motte Weaver and Edward Creveling Kimmel, Saltillo, Pa.—This patent covers a mechanism for application to a motor car, by means of which the engine may be started by operating a hand lever arranged convenient to the driver's seat. The device as shown in Fig. 2 comprises a starting shaft geared to the engine shaft; a tumbling shaft connected to the starting shaft and provided with a pinion; a slide gear mounted for longitudinal movement and having gear teeth on one side to pass over the pinion; and a hand lever to operate the slide gear.

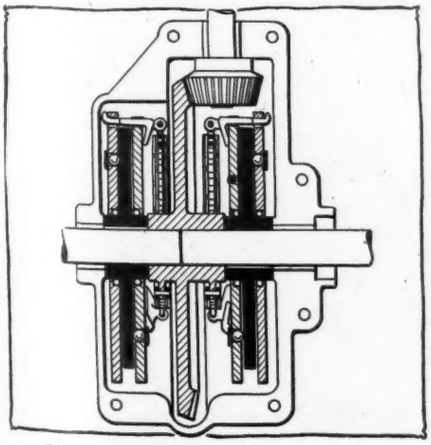


FIG. 3—TAYLOR DIFFERENTIAL

A Story of the Race Track

AGAIN using the race track for the scene of her latest motor car story, Eleanor M. Ingram in "From the Car Behind" has given us a breezy tale of the Long Island race track. The principal characters are one Gerard, a paragon of a professional driver, who through unfortunate and mysterious circumstances is seriously injured; a millionaire amateur driver whose self-sacrifice and devotion to Gerard develops a character which regains the respect and affection of his father; the amateur's charming sister; and a spoiled, jealous, and hysterical cousin. The climax is the winning of the Vanderbilt cup race by the millionaire amateur. J. B. Lippincott Co., Philadelphia.

A Transcontinental Novel

"On the Trail to Sunset," one of the latest books of fiction featuring the motor car, is by T. W. and A. A. Wilby. It is the story of a transcontinental trip in the days when such exploits had not become the fashion. A New Yorker, tired of motoring through foreign lands, suddenly decides to "break the trail" across the United States, and is accompanied by his wife and nephew. All goes well until Chicago is reached, but after the Windy City is left far behind a mystery develops and difficulties and exciting events follow in rapid succession; at one time the car is caught in the dry quicksand; at another time the tourists are caught in and spend the long, weary hours of the night in a desert sand storm. Despite all the difficulties and perplexities of transcontinentalism Cupid succeeds in bringing to a happy climax the love affairs of the nephew. Published by Moffat, Yard & Co., New York. Price $1.35 net.

The Kentucky Coal Fields

Under the title "The Kentucky Mountains" with a sub-title "Transportation and Commerce 1750 to 1911," Mary Verhoeff, a member of the Filson club, writes historically of this particular region of the Blue Grass state and its future relation to commerce through the development of the rich coal fields of the Kentucky mountains. "The lack of good roads has caused an undue isolation * * * and has retarded the development of natural resources by the exaction of enormous freight tolls, which in turn has blinded the people to their own needs. The state or federal government could render valuable assistance to road-building. The new constitutional amendment is a step in the right direction, but to avoid a repetition of past mistakes, before the adoption of a definite policy of state aid there should be a careful consideration of the economic conditions and requirements of the mountain region." Published by John P. Morton & Co., Louisville, Ky.

Fire-Fighting

From the press of the Chief Publishing Co., New York city, comes a compact little red-covered volume of 200 pages entitled "Fire Fighting." Joseph J. O'Reilly, editor of the Chief, a government weekly, has compiled the data to aid the fireman in the science of fire-fighting, and the figures and facts have been taken on high-pressure fire boats, the steam fire engines, etc. The information furnished is in the form of lessons and Captain Joseph Quinn of the New York fire department is the instructor, the twenty lessons dealing with one of the most dangerous and destructive of the elements. Then follows a list of the tools employed by the New York fire department, a chapter on the care of the steam fire engine; Joseph A. Ryan, of the water supply, gas and electricity department discusses the high-pressure system as used in New York and Philadelphia. Various other pertinent subjects are handled at length, and the concluding chapter is devoted to instructions for chauffeurs.

Book on Lord Kelvin

"William Thompson, Lord Kelvin: His Way of Teaching Natural Philosophy," is the title of a book in which, in a series of disconnected incidents, David Wilson has shown the keen, yet humorous personality of Lord Kelvin and the way in which he induced original thought among those who came under his tutelage. A suggestion here and there, a glimpse of what is, with a kindly intensity that lured the receptive mind into the broader fields of thought; and the mind must be receptive, have reached a stage where it desires such knowledge, or it will neither seek nor accept it. The student was led by his own power of reason to the point where he saw that the conservation of energy and the conservation of matter disclosed the vital principle that the universe is alive. "The steam engine is going out," Lord Kelvin would say abruptly and apparently irrelevantly to the topic of conversation, but this was one of his ways of saying there is all-pervading life. Published by John Smith & Sons, Ltd., Glasgow, Scotland.

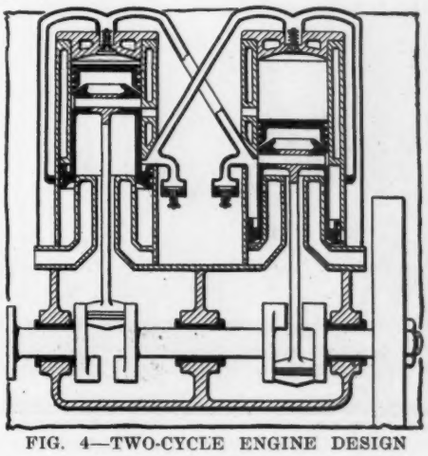


FIG. 4—TWO-CYCLE ENGINE DESIGN

Keeton Cars Appear as Four and Six

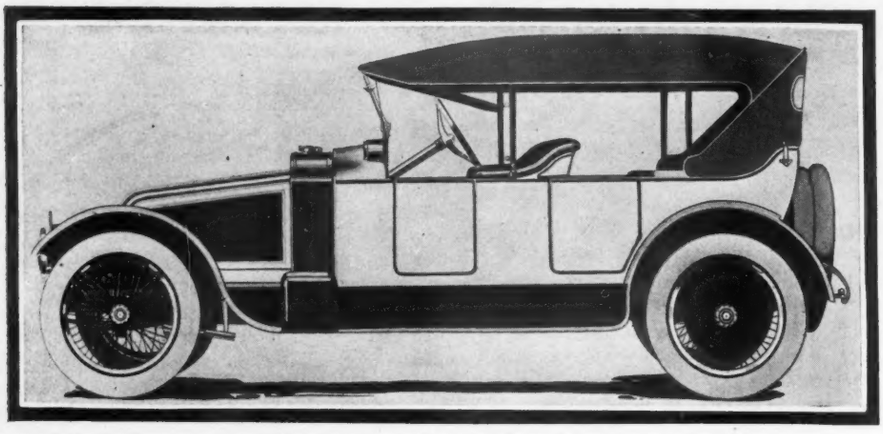


FIG. 1—NEW KEETON SIX OF FOREIGN APPEARANCE

Sloping Hood, Radiator at Dash and Option of Wire Wheels Give Distinct French Cast

TWO French-type motor cars now are being built by the Keeton Motor Co., Detroit, Mich., under exclusive patent rights in the United States. The Keeton Motor Co. is a new organization and has no connection with the Croxton-Keeton Co., of Massillon, Ohio, except that Mr. Keeton, who formerly licensed the Croxton-Keeton Co. to build certain cars of French design under his patents, is now the head of the Keeton Motor Co.

The two cars now being manufactured by the Keeton Motor Co. are almost identical in design, except that the one has a six-cylinder motor and electric dynamo lighting system, optional wire or wood wheels and 131-inch wheelbase, and the other a four-cylinder motor and a 120-inch wheelbase. There also is a slight difference in the cylinders of the two motors, the four-cylinder being cast in block and having a bore of 3.74 inches, and the six-cylinder motor having the cylinders cast in pairs and a bore of 3.75 inches; both have a 5.25-inch stroke.

Among the chief characteristics of the new Keeton design are left-hand drive, central control and an acetylene self-starting mechanism for the motor. Like the Renault, Darracq and one or two other high-grade foreign products, the radiator is arranged directly in front of the dash and the hood slopes down over the motor toward the front. The power from the motor is absorbed by a multiple-disk clutch, which is incorporated in the flywheel and transmitted through a selective sliding change-speed gearset located amidships. A propellor shaft enclosed in a torsion tube communicates between the gearset and a floating type of rear axle. The chassis frame is pressed channel steel; it is mounted on semi-elliptic front and three-quarter scroll elliptic rear springs, and the front axle is an I-beam drop-forging.

As the accompanying illustrations show, accessibility and simplicity are important features of Keeton design and construction. The cylinders of the motor are of the L-type, and in the four-cylinder engine the inlet and exhaust gas manifolds are cast integral with the cylinder casting, making but one connection for each and greatly reducing the possibility of leaky joints. Valves have cast-iron heads welded to carbon steel stems, and give a clear opening of 1⅝ inch. All are on the left side and thoroughly inclosed by readily removable plates, and push-rods are adjustable, so that their operating mechanisms may be kept quiet, clean and free from the excessive wear caused by accumulations of dust on the bearing surfaces.

Cooling of the motor is by means of a simple thermo-syphon system without pump; air-draft through the radiator is augmented by a large blower fan on the flywheel, and attention is called to the large but short and direct water connections. It also is worthy of note to see how accessible and yet how out of the way the water connections are.

A large plain three-bearing crankshaft is employed in the four-cylinder motor, whilst the six-cylinder design has a four-bearing crankshaft. The connecting rods are of generous length to reduce angularity and thereby reduce wear of the pistons and cylinders; and the bearings of the rods and shafts are of liberal dimensions. Spiral en-

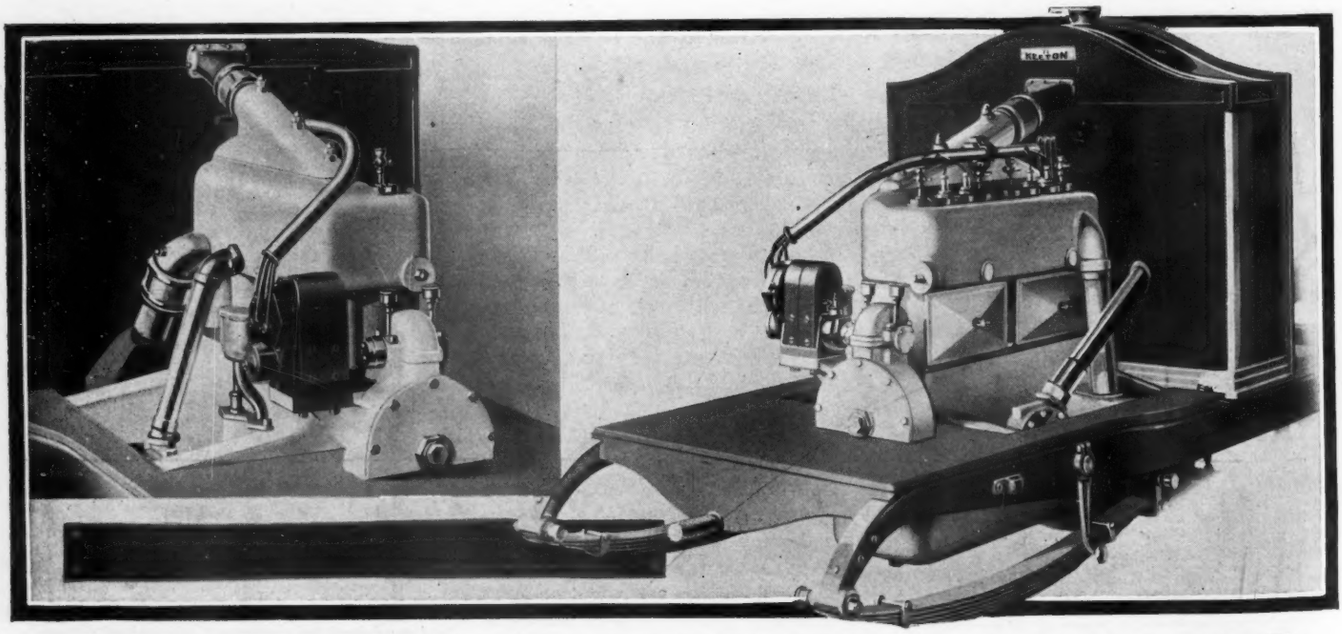


FIG. 2—TWO VIEWS OF KEETON FOUR-CYLINDER MOTOR, SHOWING COMPACT DESIGN AND PROTECTION FROM DUST

European Features Predominate in Design

Long-Stroke Motor, Center Control, Left-Hand Drive, and Acetylene Starter Characteristics

gine gears are employed to promote quietness of operation.

Lubrication of the motor is by means of a constant level splash system, in which a plunger pump draws the lubricant from the reservoir at the base of the crankcase and forces it into the splash compartments of the crankchamber. The reservoir carries a supply of 3½ gallons; and an auxiliary supply tank of 5 gallons capacity is provided, from which the motor reservoir may be replenished by simply operating a conveniently arranged hand pump. Large grease cups are fitted for the lubrication of practically all bearings not supplied by the internal motor system.

Fixed ignition is employed, with either a Bosch or Eisemann magneto as the principle source of electric current; and with a storage battery provided to facilitate starting. As illustrated herewith, the magneto is driven off a transverse shaft at the front end of the motor, and a more accessible location for this apparatus is hardly conceivable. By using the fixed spark principle the spark lever on or about the steering column is eliminated, operation of the car is simplified, and it is claimed that as the operation of the ignition system is thus automatic in its action, efficiency in motor operation and fuel consumption is obtained.

For starting the motor from the driver's seat, a device on the dash may be operated to allow a charge of acetylene gas to flow from the gas tank through a distributer that directs it to the cylinder, whose piston is in firing position; then by pressing a button the charge in the cylinder is ignited, the piston is forced down and the motor started.

The clutch, which is encased in the flywheel and runs in oil, comprises forty cone-shaped disks 8 inches in diameter. Its design is such that smoothness of action is one of its features, and it requires no adjustment after leaving the factory.

Three speed changes forward and one reverse are provided in the transmission gearbox. This mechanism is a short compact construction with the main and countershafts arranged in the same horizontal plane and mounted on large imported annular ball bearings. It is mounted by three-point suspension so that the alignment of the shafts may not be affected by contortions of the side-frame members on rough roads; and by having the gear-shifting lever mounted in the cover of the gearcase, the control mechanism is greatly simplified, and disassembly for inspection of adjustment is greatly facilitated when an overhauling becomes necessary. Every unit of the classis is distinct from the rest and can be very easily removed without disturbing any of the others.

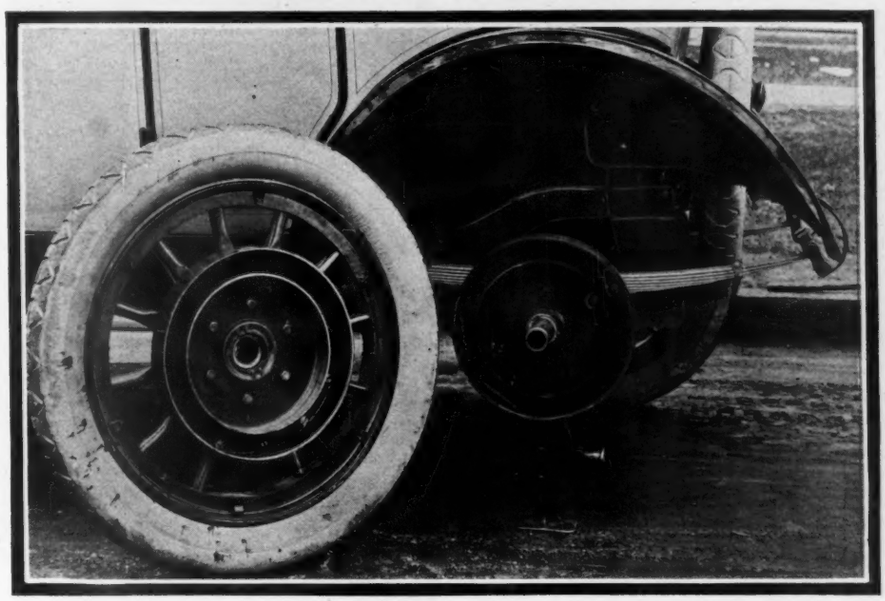


FIG. 4—CONCENTRIC INTERNAL BRAKES ON INDEPENDENT DRUMS

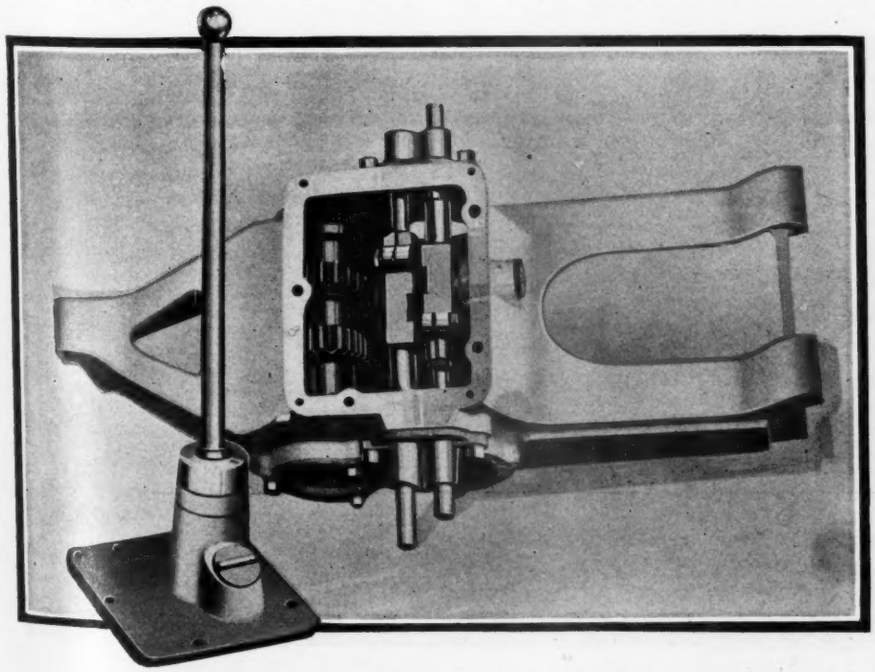


FIG. 3—GEARSET AND CENTRAL CONTROL LEVER OF KEETON

Being inclosed in a torsion tube, the propellor shaft has but one thoroughly enclosed universal joint at the forward end. It transmits power from the gearset to the floating design of rear-axle, whose bevel gears and main operating mechanisms also are mounted on imported annular ball bearings. The axle housing is of pressed steel, and the drive shafts are 1⅜ inch in diameter. A notable feature in connection with the rear axle is the arrangement of the brake operating levers inside of the chassis frame. This simplifies construction and improves the general appearance of the car.

As illustrated in Fig. 4, the brakes are both of the internal expanding type, acting on two separate concentric drums. The emergency brake operates on the inner or smaller drum, which is 12 inches in diameter, whilst the service brake acts on the outer drum, which is 16 inches in diameter; both drums have a 2½-inch face.

The chassis frame is of pressed steel,

channel section. It is narrowed in front of the dash to give a small turning radius and thereby facilitate turning the vehicle around in a narrow street. The driving strains from the rear axle are transmitted to the frame through the springs; and the tube inclosing the propellor shaft conveys the torsional strains to it. The frame also sweeps upward 5 inches over the rear axle to give plenty of room for spring action.

Springs are from a special spring steel alloy; the front ones are 36 inches long, the rear ones 50 inches long, and both are 2 inches wide. The drop-forged front axle is of I-beam section, and the wheel spindles are equipped with annular ball-bearings such as are used throughout the running gear of the car. Wheels are fitted with demountable rims; an extra rim is included in the equipment; and special double tire irons are fitted to the rear end of the car, between the springs on the touring car and coupe, and on rear deck of the roadster.

Control of the car is by means of a worm-and-gear steering mechanism comprising a 20-inch wheel, with a throttle lever underneath the wheel; a gear-shifting lever is conveniently located in the center; a combined clutch and service brake pedal is provided for operation by the left foot; and a right-foot pedal is used for operation of the emergency brake. An accelerator pedal also is provided.

Three standard body constructions are fitted to these chassis. A fore-door touring car body made of sheet steel over a wood frame and designed for comfortably seating five passengers, a fore-door roadster of two-passenger capacity of similar construction and having a tire deck and space for carrying two suitcases, and a coupe body of three-passenger capacity. Running-boards, steps and toeboards are of cast aluminum, with sheet metal mudguards and aprons to prevent them and the body from being splashed with mud. These body designs are finished in three standard color combinations.

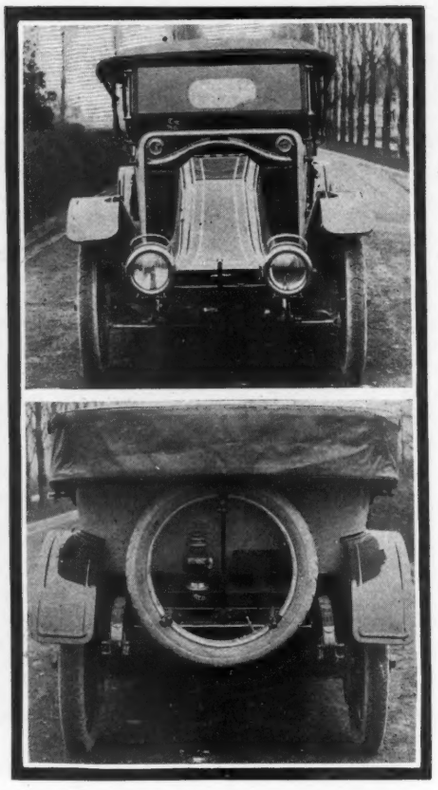


FIG. 6—FRONT AND REAR VIEWS OF KEETON

Manufacturers' Communications

RED HEADLIGHTS IN JAPAN

DETROIT, Mich.—Editor Motor Age—That the export trade of the American motor car manufacturer is expanding, and expanding in rapid strides, has been proven by shipping reports of the various manufacturers who send their cars into the foreign countries. One of the most enthusiastic foreign boosters of the American motor car is the country of Japan. This energetic race of people has taken to the motor car with that same eagerness and desire to learn that has always been a notable feature with the Japanese. From the old fashioned two-wheel cart drawn by a Japanese runner they have rapidly risen to the most up-to-date motor car within 3 or 4 years.

E. W. Frazar, who is the agent for the Ford Motor Co. in Japan, while on a recent visit to the home factory in Detroit, related a few of the Japanese rules governing the use of the motor car. In Japan the glass on the front oil lamps must be red, while in place of our red light on the rear lamp, Japanese law requires a green one. The speedometers are also slightly different inasmuch as they must show a maximum speed hand. This hand registers the fastest speed the car ever has attained, and should you ever be arrested for fast driving in Japan, the first thing the officer would look at would be your maximum speed register.

While in Detroit Mr. Frazar produced a very interesting card which proved to be the official drivers' license for the country of Japan. It was an odd-looking card about the size of a business card and was written on both sides in Japanese characters. A large red seal of the city of Tokio was shown on one side, together with the license number of the motor car, license holder's name and address and personal appearance.

In returning to Japan, Mr. Frazar ordered a large number of extra fenders to be shipped. "Fenders" he says "are the most needed of any part on the car." On account of the narrowness of Japanese streets and their crowded condition, with small push cars, etc., the fender stands a very small chance for long life and far-be-it from the aristocratic Japanese gentleman to be driving a car with a smashed fender. Replacements of fenders therefore are very numerous.—Ford Motor Co.

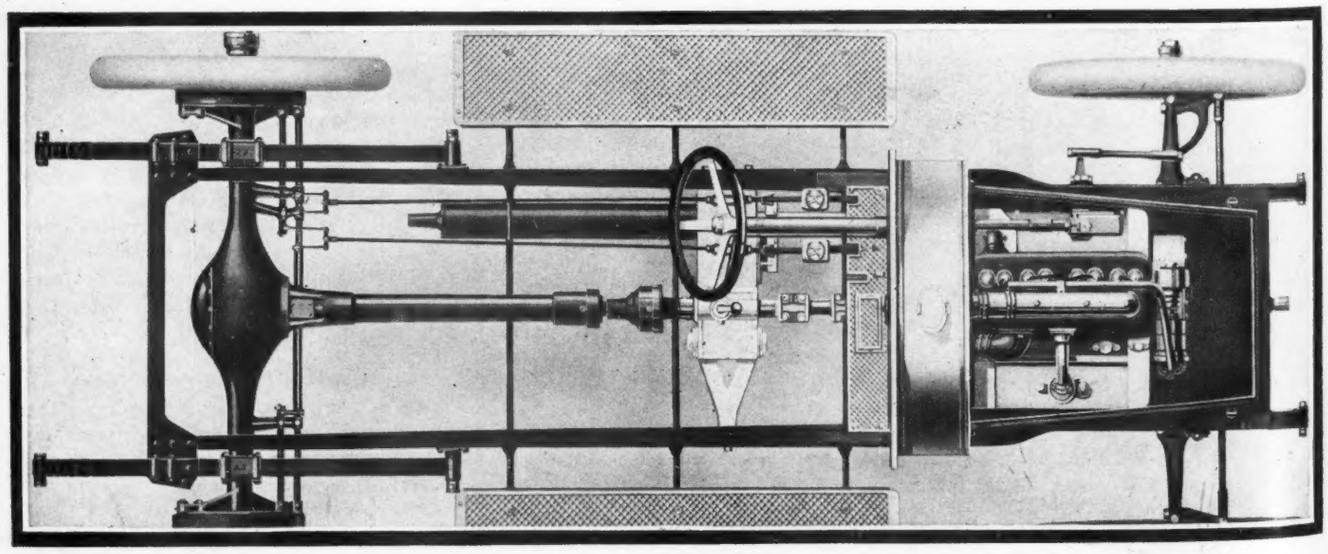


FIG. 5—PLAN OF KEETON FOUR-CYLINDER CHASSIS

The Mathematics of Motoring

ONE of the confusing terms to many motorists is the term gear ratio, but its application and the method of determining it are quite simple. Gear ratio, unless otherwise stated, usually refers to the direct drive alone, when the transmission gears are not in operation, and it is on the direct drive that the calculations for the speed of the motor and speed of the car are usually made. By gear ratio is meant the proportionate speed in revolutions per minute between the motor and the driving wheel. On the direct drive this is determined entirely by the bevel gears in the rear axle and the ratio between motor speed and wheel speed is the same as that between the number of teeth in the bevel gear in the rear axle and the number of teeth in the pinion on the end of the drive shaft. For instance, if there are 19 teeth on the pinion and 53 teeth on the bevel gear the gear ratio is 53 divided by 19, or 3.45 to 1, slightly less than 3½ to 1.

If the gear ratio of the car and the size of tires are known it is a simple matter to calculate at what speed the car will go at any given speed of revolution of the motor. Suppose we have a car with a gear ratio of 3½ to 1 on the high or direct drive, 36-inch wheels and a motor capable of developing its full power at 1,200 revolutions per minute; to find the speed of which the car is capable. Each time the wheel turns over the car travels forward a distance equal to the outer circumference of the wheel. The circumference of a 36-inch wheel is 3.146 × 36 = 113 inches or 9.4 feet. To make allowance for slip and compression of tires, say 9 feet. With a 3½ gear ratio the wheel turns over $\frac{1}{3.5}$ or .286 times and the car travels a distance of

9 × .286 = 2.48 feet per revolution of the engine.

If the engine runs at 1,200 revolutions per minute the car travels.

1,200 × 2.48 = 2,910 feet per minute, or 174,600 feet per hour.

Dividing by 5,280, the number of feet in a mile, we have 33 miles an hour as speed of the car.

Of course, any one of the other factors can be determined just as easily if the rest are known. For instance, the revolutions of the crankshaft per minute can be found for any speed if the gear ratio and tire size are known, or the gear ratio can be calculated if tire size, car speed and crankshaft speed are known. It is not necessary to make these calculations, for any of these problems can be solved directly by means of the chart on this page. The solution of four problems will explain the chart.

Given the miles per hour, gear ratio,

Gear Ratios and Speed

and tire sizes, and the revolutions of a crankshaft per minute: To solve this select the miles per hour on the left-hand margin. For illustration, suppose the car is traveling at 80 miles per hour with 34-inch tires and a gear rating of 1.5 to 1. From the figure 80, move right to the intersection of the gear ratio line designed as 1.5. From this point move up to the diagonal of 34 inches. From this point move right to the margin where the revolutions of the crankshaft speed per minute are shown; 1,200 in this case.

Given the crankshaft revolutions per minute, the tire diameters and miles per hour, find the gear ratio. Supposing the motor is turning over at 1,000 revolutions per minute, that 42-inch tires are used, and the car is traveling at 50 miles per hour. Go left from the 1,000 on the right margin until the intersection of the 42-inch tire-size line. From this point go up to the intersection of the 50-mile-per-hour horizontal line. The intersection of this line also cuts the gear ratio 2.7 line, which is the gear ratio employed.

Given crankshaft revolutions per minute, size of tires and gear ratio, in order to find miles per hour, proceed as follows: Go left from crankshaft speed—say 1,000 revolutions per minute—to tire size—say 28-inch. From this point go up or down to intersection of gear ratio line—say 1.5. Then go left to 55 miles per hour.

If we have given crankshaft speed in revolutions per minute, miles per hour and gear ratio, the tire sizes may be obtained by going left from crankshaft speed to the intersection of the gear ratio line and thence up or down to the miles per hour, which point will mark the intersection of the required tire diameter.

If it is desired to find the gear ratio on one of the lower speeds the two pair of gears in the transmission gearset must be considered as well as the beveled gears. One pair of gears in the gearset is in mesh all the time on most cars and is used on all but direct drive. Suppose that the gear on the clutch shaft has 20 teeth and the gear driven by it on the secondary shaft has 38 teeth and the driving pinion on the secondary shaft has 18 and the driver on secondary shaft has 40 teeth. To find the ratio of the gearset, divide the product of the driven gears by the product of the driving gears.

With this set of gears in mesh the ratio in the gearbox is $\frac{38 \times 40}{20 \times 18}$ If this is then multiplied by the bevel gear ratio $\frac{53}{19}$ the gear ratio of the whole transmission system is given. Thus,

$$\frac{38 \times 40 \times 53}{20 \times 18 \times 19} = \frac{106}{9} = 11.8, \text{ or}$$

that is, the crankshaft turns over 11.8 times when the driving wheels turn over once.

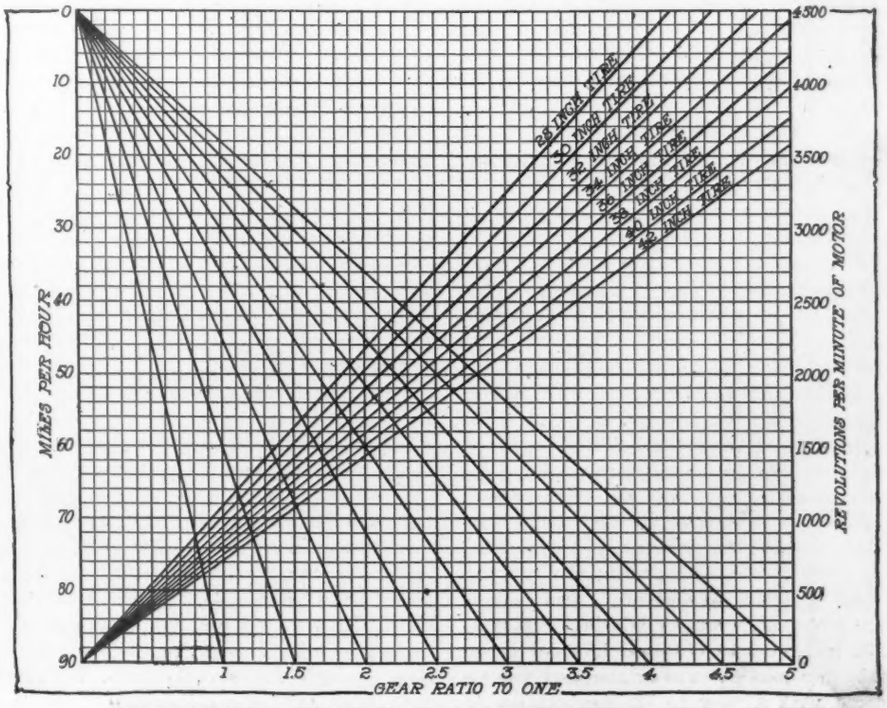
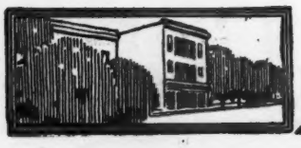
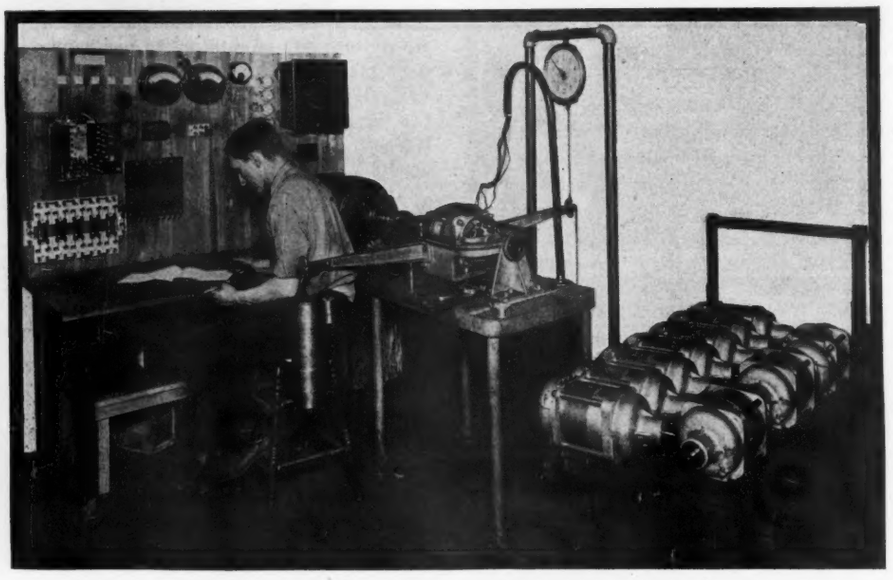


CHART SHOWING RELATION OF GEAR-RATIO, WHEEL SIZES AND SPEED



Among the Makers and Dealers



TESTING APLCO SELF-STARTER

CARTERCAR Activity—The Cartercar company reports it is running its plant at Pontiac, Mich., day and night in order to turn out 3,000 cars this season.

New Battery Concern—The Perfection Storage Battery and Lighting Co., of Chicago, has been organized by Carl E. Winters, who claims to have a battery that will yield 350 cycles of recharge and discharge.

Dallas Doing Well—That the car sales in Dallas, Texas, during the past year have gone beyond the first anticipation of those in the business is seen by the fact that May 3 the 3,000th car for the city of Dallas was sold. One year ago only about 1,000 machines were driven over the streets of the city.

Sells Windshield Stock—The Eagle Co., of Newark, N. J., has discontinued the manufacture of Standard, Friction and X-L windshields because of need of space in the factory for other manufacturing. It has disposed of the entire stock of Standard and Friction shields to Charles Weiland, 149 Chambers street, New York city, and will confine itself in the future to making the Eagle rain-vision shield.

Garage Law Amended—The district commissioners of Washington, D. C., upon the recommendation of the building inspector, have decided to amend the building regulations so as to permit the establishment of garages in squares already occupied by them without the consent of surrounding property owners. At present the law provides that the consent of 75 per cent of the owners of property within a radius of 200 feet must be obtained in order to establish a garage. The amendment was ordered with a view to the colonization of garages. It is believed that if garages are colonized, the objectionable features will be centralized and nuisances minimized.

Invades Europe—Seymour Obermer, of Paris, has closed for the European rights to manufacture Gabriel rebound snubbers and is now erecting a factory for that purpose.

Join Credit Association—The following concerns have recently been elected to membership in the Automobile Trade Credit Association: Essex Rubber Co., Trenton, N. J.; Class Journal Co., New York city; Hoffman Core Mfg. Co., New York city; W. E. Pruden Hardware Co., New York city.

Abbott Expanding—In order to provide for a 25 per cent increase in output of motor cars during the coming year, the Abbott Motor Co., of Detroit, has purchased a large plot of land along Beaufait avenue, adjoining on the north of the present factory. Plans now are under way for the erection of permanent buildings to occupy the newly acquired property and actual construction will begin within the course of a few weeks.

Ford Plant for Milwaukee—Milwaukee has been selected by the Ford Motor Co. of Detroit as the location of one of the three proposed assembling plants in various sections of the United States, according to announcement made by the Hickman-Lauson-Diener Co., Milwaukee, state agent for the Ford. The company has leased the Courteen dock property on the Kinnic-Kinnic river and will erect several factory buildings. Eight carloads of materials, enough for seventy cars, already have been shipped to Milwaukee. It is expected that the Hickman company will take a much larger territory for the 1913 season than it has at present.

Barnes' New Line—Claire L. Barnes & Co., of Chicago, hereafter will market the products of the E. B. Van Wagner Mfg. Co., Fort Pitt Steel Castings Co. and the Simmons Mfg. Co.

Omaha Has a Fire—The three-story building at 1113 Farnam street, Omaha, Neb., occupied by the Nebraska Cartercar Co., was damaged by fire last week to the extent of $10,000. There were twenty cars in the building at the time.

Goodyear Sales Increase—The Goodyear Tire and Rubber Co. announces that its 1911 sales increased 500 per cent over 1910 and that 1912 will exceed even this large percentage. In 1911 it is asserted tire equipment for 102,250 cars was turned out, while it is expected 250,000 will be shod in 1912.

Indiana Dealers Will Organize—Motor car dealers of Indiana are preparing to organize an association for their mutual benefit. A meeting at which preliminary steps for organizing such an association has been called and will be held at the Claypool hotel in Indianapolis on the evening of May 17. W. S. Gilbreath, secretary of the Hoosier Motor Club, and Dale Ogden, of Columbus, are arranging the meeting.

R. C. H. Clothes Its Workmen—The R. C. H. Corporation has decided to hereafter give its employes working clothes. Each man will get two suits of overalls, which will be kept cleaned and repaired by the company. The R. C. H. Corporation is increasing wages on individual merit rather than by general raise and President Hupp states that since January 1 there have been 317 individual increases. In this way the daily average wage of these employes has been raised 26.6 cents.

New Hupp Factory—The new plant of the Hupp Motor Car Co., of Detroit, located at Milwaukee and Mt. Elliott avenues, consists of three main industrial buildings, two stories in height, covering a factory floor space of several hundred thousand square feet, erected in parallel, with road and trackage room between each pair of structures. More than a ½ mile of railroad track is included within the property of the plant. These buildings are connected on the upper floors by means of communicating bridges and are bounded on the rear by belt line tracks, along side of which is a large shipping platform. An administration building—also two stories in height—which includes a floor space of nearly 30,000 square feet extends across the front of the property.

In the rear of the property is an electrical transformer house for supplying light and a boiler house for furnishing heat.

Hildebrand Joins Ford—C. C. Hildebrand, former vice-president and sales manager of the Chalmers company, has been appointed a special representative of the Ford Motor Co.

May Move to Batavia—The Whyland-Nelson Motor Car Co., of Buffalo, has forwarded to the Boosters' Club of Batavia, N. Y., a proposition that if Batavia will purchase $25,000 stock from the Buffalo concern it will locate in Batavia. The Boosters' Club has taken the matter under consideration.

Another Locomobile Branch—The Locomobile Co., of America, announces the opening of a factory branch and service station in Los Angeles for the convenience of its customers in southern California and the southwest. Until proper quarters can be erected, this factory branch will be located at 942 South Grand avenue, Los Angeles. J. Murray Page has been appointed manager.

Juno Officers Elected—The recent reorganization of the Juno Motor Truck Co., Juneau, Wis., has resulted in the infusion of some new blood into the concern. L. C. Pautsch has been elected president, Theo. Henning, vice-president; Henry Henning, secretary, and William McDougall, general sales manager. The first three are all residents of Juneau, while McDougall formerly was general agent of the Kisselkar at Milwaukee.

Aplco Starter Test—An accompanying illustration shows the dynamometer testing apparatus in use at the plant of the Apple Electric Co. Every Aplco electric self-starter receives a final test upon one of these machines before it is shipped. As a motor its efficiency is tested by a brake and the machine must develop 200 per cent more power than is required to turn over the motor car engine to pass inspection. As a dynamo it must generate sufficient current to light all lamps and maintain the charge in the storage battery at a speed corresponding to approximately 12 miles per hour of the car.

Just the McCue Co.—In the description of the McCue wire wheel published recently in Motor Age, the name of its maker was given as the C. T. McCue Co. The initials, however, are superfluous—the title of the concern is just plain McCue Co.

Profits of Tent Show—The Indianapolis Automobile Trade Association has returned 50 per cent of the amount paid for rental space to exhibitors in the motor show held in a tent in Indianapolis during March. In addition the association has set aside $1,000 to be applied on the erection of a coliseum, provided a contract for the building is let by April 1, 1913.

Buick Branch Manager Dies—Lawrence A. Brown, manager of the Milwaukee branch of the Buick Motor Co., died suddenly in his apartments. Mr. Brown went to Milwaukee in May, 1910, to take charge of the Buick's truck department and later was given charge of the Milwaukee offices. He is survived by a wife and two children. Interment was at Tecumseh, Mich.

Appleton Probable Choice—The Four Wheel Drive Automobile Co. of Clintonville, Wis., has practically consented to locate its new permanent plant at Appleton, Wis., on the condition that Appleton capital buys $100,000 worth of the stock of the corporation. The chances are that the proposition will be accepted by the Appleton Commercial Association.

Electrical Show Planned—The Engineering Society of Milwaukee has decided to hold the next middle western electrical show at the Auditorium in Milwaukee during the third week of February, 1913. The exposition will be representative of the entire middle western electrical manufacturing field and the motor car appliance and accessory industry, including magnetos, coils, batteries, lighting systems, dynamos, etc., will be made a feature. The show will be conducted under the joint auspices of the Engineering Society of Milwaukee, Wisconsin Electrical Association and Wisconsin Contractors' Association.

McKinney Becomes Tradesman—C. C. McKinney, recently with the Commercial Vehicle, of New York, has become identified with the Chicago branch of the Dayton Auto Truck Co., as superintendent of the transportation department.

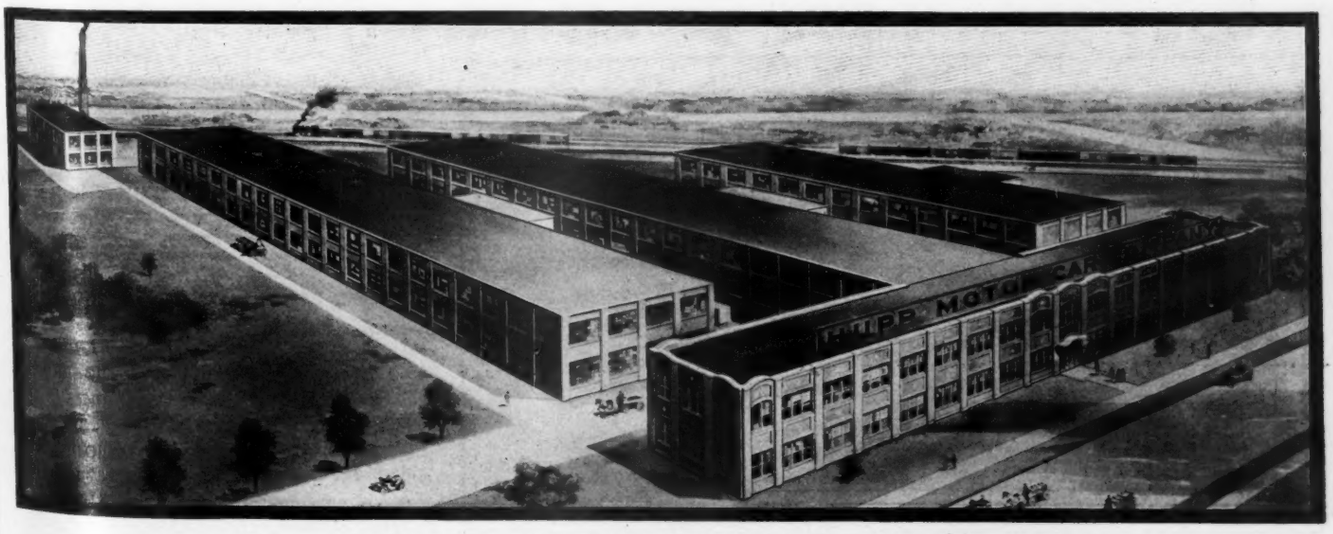
Detroit Suits Cadillac—Defiance, O., which was bidding for the new plant the Cadillac company is contemplating building, has been notified that the branch factory will be built in Detroit.

Hupp Working Day Reduced—The Hupp Motor Car Co., of Detroit, in order to increase wages, has reduced the working hours in the factory from 10 to 9 hours, paying the men for a 10-hour day. This, it is declared, is equivalent to a wage increase of 11.17 per cent.

Benson Studebaker Sales Manager—The vacancy caused by the resignation of Paul Smith as sales manager of the motor car department of the Studebaker Corporation has been filled by the appointment of Ernest R. Benson, for 5 years sales manager of the Cadillac Motor Car Co.

Reo's Canadian Business Grows—The increase of Canadian business of the Reo Motor Car Co. has necessitated the purchase of 4 acres of ground at St. Catharines, Ont., to be used as the site for a new motor car factory in which 400 men will be employed. The Reo company, which sold about 300 cars in Canada so far this year, is preparing to turn out about 1,000 cars next year.

Many Inspect Maxwell Plant—Visitors' departments in large car factories are growing apace with those of other industries and the work of entertaining industrial students has become a task of large proportions. At the plant of the Maxwell-Briscoe Motor Co. in New Castle, Ind., in the month of April, there were nearly 200 visitors representing eight states and two foreign countries. No dealers or persons calling on regular business are included in this number.



VIEW OF NEW PLANT OF HUPP MOTOR CAR CO. OF DETROIT.

Developement Briefs

Invex Self-Starter Operated by Button on Steering Wheel—National Exhaust Horn for Small Cars—Diamond Calculator Tells Length of the Chains

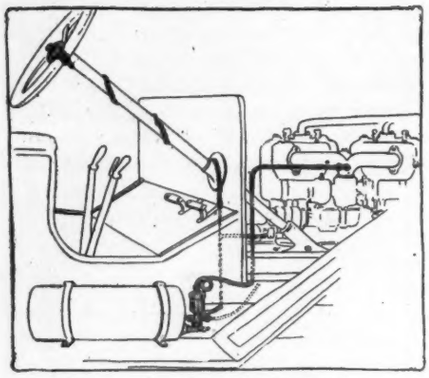


FIG. 1—INVEX STARTER

National Exhaust Whistle

IN Fig 3 is shown the latest model of the National whistle made by the National Signal Co., Brooklyn, N. Y., and in connection with it is shown the new adapter or universal coupling device. The adapter seems to possess particular merit inasmuch as it does away with all special fittings and couplings; the horn is merely slipped over the end of the exhaust pipe, clamp screws are tightened, and the adapter is immediately attached to the pipe with what is said to be a non-leaking joint regardless of the size of the pipe.

A feature of the horn itself is the unique construction which is designed to eliminate choking up from carbon accumulations. In most exhaust horns the accumulation of carbon on the valve seat prevents complete closing of the valve. In the National the valve is not seated, nor does it completely close. With the swinging valve in the position shown in the middle sketch, the exhaust passes noiselessly through the horn. To operate the horn the valve swings downward, opening the sound chamber and almost completely closing the exhaust passage—leaving a mere slit through which the exhaust is forced in a thin current, which, as it breaks against the sharp edge of the opening opposite, is converted by the resonance of the sound chamber into a powerful note. This position is shown at the right. It is claimed that a deposit of carbon would merely tend to close the slight crack about the valve and add to the efficiency of the horn.

The largest size National horn is only 8 inches in length, including the adapter and weighs less than 3 pounds. A new size has just been added to the National line. This is an exhaust horn designed especially for small runabouts. It is 4½ inches long and weighs less than 1 pound.

Diamond Chain Lineometer

The usual method of determining the length of chains for chain drive is rather cumbersome mathematical calculation and requires the use of trigonometric tables. When the operation has to be repeated many times a day the time and labor entailed is considerable. In order to obviate the necessity of such an expenditure of time and eliminate the chance for error, the Diamond Chain and Mfg. Co., Indianapolis, Ind., has designed an instrument by which chain lengths can be quickly determined by making three simple adjustments.

The instrument in its simplest and cheapest form is shown in the lower portion of Fig. 2. The fixed scale C is laid off in half-inch divisions, each representing a distance equal to the pitch of the chain. On the movable scale E, each half-inch division represents a distance equal to two pitches—one for the upper half of the chain, and one for the lower half. The circles on the sectors A and B are the pitch circles of 1-inch pitch sprockets drawn half size. Points on the spirals are found by stepping off ½-inch chords on each of the pitch circles beginning at the horizontal radius to the left of G and to the right of F. Through all points one step removed from the horizontal radius, a curve is drawn and marked No. 2. Through all points two steps removed, a curve is drawn and marked No. 4, and so on. The number of any spiral represents the number of chain links from the point where it crosses a given circle to the corresponding point on the lower half of the circle.

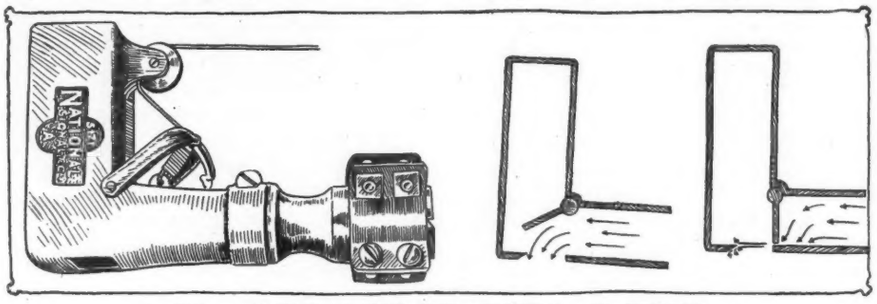


FIG. 3—NATIONAL EXHAUST WHISTLE AND THEORY

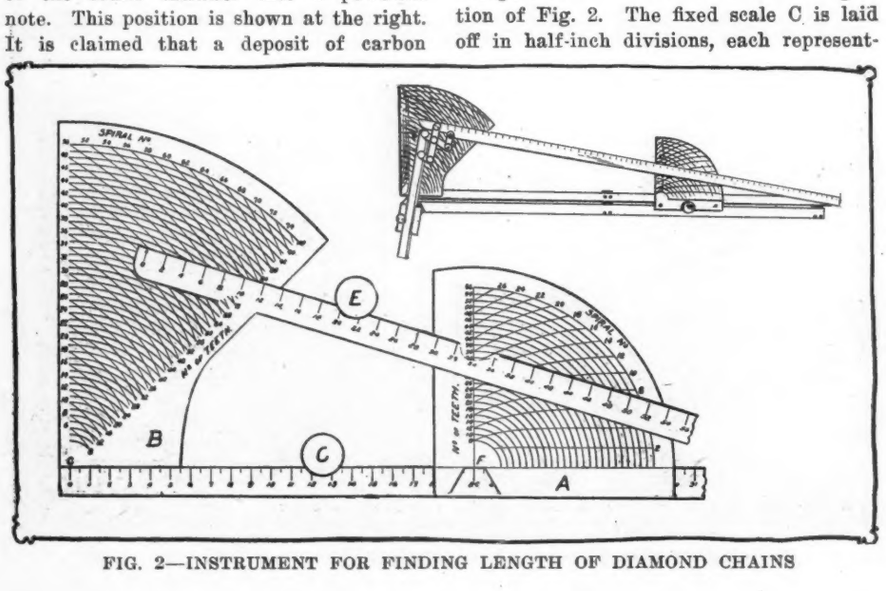


FIG. 2—INSTRUMENT FOR FINDING LENGTH OF DIAMOND CHAINS

In the steel instrument shown at the top, the adjustments are greatly facilitated. The right-hand sector is quickly clamped in position by the thumbscrew; the zero point of the straight-edge is brought to the proper pitch circle by the slide which is graduated on the left for roller chains and on the right for block and twin roller chains. The link-work allows the straight-edge to swing about its zero point, while the latter is open to the view of the operator.

Invex Starter

One of the simplest of the ignition type of engine-starting devices is the Invex starter illustrated in Fig. 1. This is one of the class of starters in which acetylene gas is fed to the intake manifold of the motor on the last few revolutions after ignition has been cut off, so that there is a charge of the gas in the cylinders for the succeeding start. The features of the device are its simplicity of operation and the method in which the control valve is operated. No gas connections are taken to the dash, instead there is an electromagnetic valve at the gas tank. This is operated by

Novelties for Motoring

Red Head Spark-Plug Wrench—Wilcken Divided Springs—Peerless Hot-Water Car Heater Utilizes Heat of Cooling System to Keep Passengers Warm

the battery through a pushbutton located on the steering wheel. Pressure on the button cuts off ignition and at the same time opens the gas valve at the tank and admits gas to the cylinder so that the operation of priming the motor for the start as well as cutting off ignition for stopping the motor is by a single pressure of the button on the steering wheel. To assist starting in cold weather, or if the carbureter does not pick up readily, a touch on the button before throwing on the ignition switch puts acetylene gas in the manifold usually sufficient to run the motor until it takes up its regular cycle. The whole device weighs but 2 pounds and can be put on without cutting the dash. It is manufactured by the Webb-Veitch Co., New York.

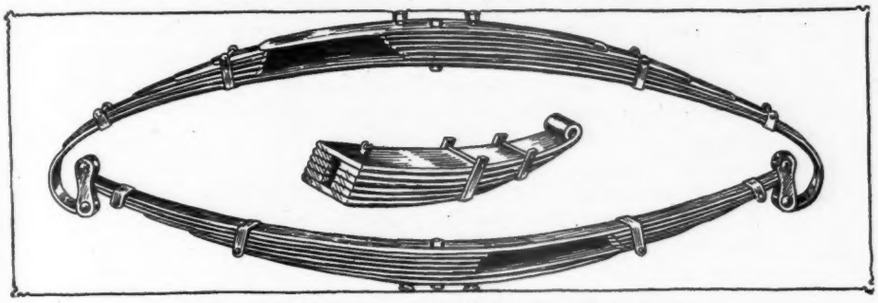


FIG. 4—FEATURES OF WILCKEN DIVIDED SPRING

Peerless Hot-Water Radiator

Utilization of waste heat from the motor to keep the occupants of the car warm has been the subject of a great deal of experiment, most of it with the idea of employing the heat of the exhaust gas. The Peerless Radiator Co., Gibbs, Idaho, in its car heating system utilizes the heat contained in the cooling water. The system is shown in Fig. 5. It will be seen that the water for the heating radiator is taken off where the cooling water is hottest; that is, as it is leaving the cylinder. From there it passes through a valve on the dash to two radiators, one in the forward compartment and the other in the tonneau. From the latter radiator it is led back to the cooling system at the point where the water is coldest; that is, just before it enters the pump. A detail of the heater is offered at the right.

Red Head Spark Plug Wrenches

Although the need for a flat wrench for handling spark plugs has always existed, the Emil Grossman Co., New York, manufacturer of the Red Head spark plug, probably is the first to recognize the fact. This firm has put out a set of wrenches for removing and putting plugs in the cylinder and also for dismantling the plug. The Red Head wrench set consists of an 11/16-inch wrench for the bushing and a ⅞-inch wrench for the shell of the plug. The chance for damaging plugs in dismantling them is eliminated, for the size of the wrench does not permit sufficient leverage to endanger the porcelain, also as the wrenches are flat and grip the hexagon nut firmly, they cannot slip off and break the porcelain. The method of using the wrench is illustrated in Fig. 6.

Liquid Gun Metal

Liquid gun metal is a specially prepared coating for giving the popular finish to lamps, radiators and other brass work. It is applied with a brush and two coats of the finish should be used. Each coat requires 1 night in which to dry. It is stated that the finish will withstand the heat to which lamps are subjected and it is not necessary to roughen the surface before applying it. It is made by the Arsenal Varnish Co., Rock Island, Ill.

Wilcken Divided Spring

A novelty in the way of car springs is the Wilcken patent spring made by the Wyoming Lubricating Leaf Spring Co., Sheridan, Wyo. Fig. 4 shows the features of the divided spring, and many advantages are claimed for this design. It will be noticed that the inner leaves are in two portions instead of being continuous as in the ordinary construction. In addition to being divided transversely the leaves are divided longitudinally as well, so that there is a channel left inside the spring. The division in the inner leaves relieves them of internal strain contracted in the process of being tempered. A channel formed in each leaf by the dividing cut is made use of for lubrication; a hard oil is forced into this channel through a grease cup placed on the short leaf, the lubricant working between the spring leaves by the action of the springs forms a coating between the members of the springs. This is claimed to prevent friction, rusting, chafing, pitting and crystallization and at the same time relieve the occupants of the car of annoying squeaks in the front and rear springs.

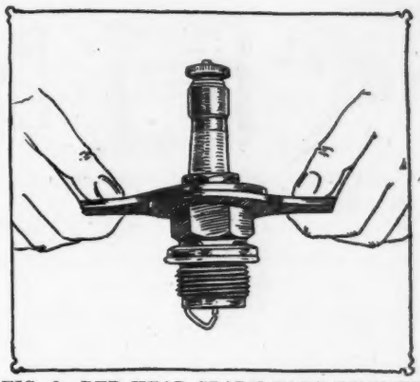


FIG. 6—RED HEAD SPARK PLUG WRENCH

Victor Air Compressor

Air compressors for garage use are manufactured by the Victor Electric Co., Chicago. The type of compressor featured for this purpose is a double-acting compressor with a vertical cylinder on each side and a pulley in the center and is intended to be driven from a line shaft. The cylinders are 2 1/2 inches in bore and 2-inch stroke and have a capacity of 4 cubic feet of free air per minute at a speed of 350 revolutions per minute. It is stated that a pressure of 135 pounds may be obtained easily. Other types are offered for gear drive or connection to electric motors.

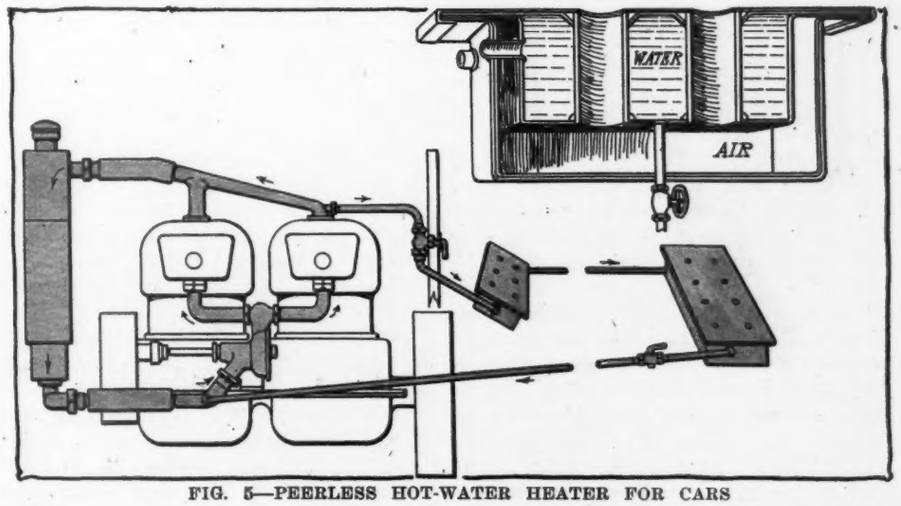


FIG. 5—PEERLESS HOT-WATER HEATER FOR CARS

Brief Business Announcements

New Agencies Appointed by Pleasure Car Makers

Town	Agent	Make of Car
Baltimore, Md.	Chesapeake Motor Car Co.	Hupmobile
Baltimore, Md.	Michigan Motor Branch	Michigan
Huntington, W. Va.	Michigan Motor Sales Co.	Michigan
New Castle, Pa.	Jesse P. Moore	King
Plainfield, N. J.	O. A. R. Motor Co.	King
Portland, Ore.	F. W. Vogler	Little
Philadelphia, Pa.	Henry A. Rowan, Jr.	Cole
Puyallup, Wash.	A. J. Williams	Ford
Salt Lake City	Salt Lake Automobile Co.	Detroit
Seattle, Wash.	Leonard McClure	American
Seattle, Wash.	Sears Motor Car Co.	Regal
Sydney, Australia	Frank Saunders, Ltd.	Crow
Torrington, Conn.	Elmer Pratt	Ames
York, Pa.	North York Auto Repair Shop	Hupmobile

TOLEDO, O.—The Toledo Vulcanizing Co. now is located at 1006 Madison avenue.

Kansas City, Mo.—The Standard Engineering Co. has opened its new salesroom at 1116-18 East Fifteenth street.

Milwaukee, Wis.—The Milwaukee Tire and Supply Co., 457 Milwaukee street, has taken the state agency for the Sears-Cross speedometer.

Cleveland, O.—The Motz Tire and Rubber Co. announce the opening of a branch office at 2352 Euclid avenue. C. R. Serfoss will be in charge.

Philadelphia, Pa.—The J. M. Shock Absorber Co., maker of shock absorbers bearing the same name, have opened a branch at 210 South Seventeenth street.

Minneapolis, Minn.—The Jackson Motor Co., representing the Jackson, now has 14,000 square feet of floor space at 1528 Hennepin avenue. The building will hold 100 cars.

Centralia, Wash.—G. C. Berlin has erected a concrete garage on the Pacific highway, and has taken a sub-agency for Regal cars through the Jefferson Avenue Motor Co., Tacoma.

Boise, Idaho—Norman Gratz of this city has closed a deal to handle the Cadillac exclusively in this territory. Mr. Gratz will at once erect a garage. He expects to do a general garage business.

Philadelphia, Pa.—The local agency of the Lenox car has been taken by the Boulevard Sales Co., 1405-1407 Race street. The territory of the new agency comprises Pennsylvania, Delaware, New Jersey and Maryland.

San Jose, Cal.—Wickland & Britton are erecting a modern building for the purpose of engaging in machine shop practice, motor car repairing in all its branches, and the manufacture of pneumatic jacks for motor use.

Manitowoc, Wis.—The Aluminum Castings Co. of Cleveland, O., the principal western plant of which is located at Manitowoc, Wis., has taken the first step in the proposed removal from that city by leasing its works to the Chicago and North-Western Railroad Co. Negotiations for the purchase of a large foundry plant in Milwaukee, commenced several weeks ago, have not been closed as yet.

York, Pa.—A tire repair shop has been opened by Stokey & McNelis, at 214 West Market street.

Montreal—The Montreal Locomotive Works is now located in the Westmount garage. It handles the Alco truck.

Washington, D. C.—The Herreschoff agency has been given to W. Kerr Gilmour, who has opened offices at 1412 G street, N. W.

Los Angeles, Cal.—The H. O. Harrison Co., distributor of Peerless cars, has recently commenced the construction of a $90,000 concrete garage.

Malden, Mass.—The Belmont Hill garage has been opened. It is a brick structure of fireproof construction 70 by 110 feet and having a capacity for sixty cars.

Marinette, Wis.—Eugene St. Peter has purchased a building on West Front street and is remodeling it into a garage. He has the local agency for the Ford, Buick and Kisselkar.

Charlotte, Mich.—J. A. Fritz & Co. have established a new garage in the Garber building on East Lawrence avenue. Ed. Donovan will have his headquarters at the garage with the Cutting car.

Pawtucket, R. I.—Jerry L. Wightman has taken over the Broadway Automobile Co. at 66 Broadway, Pawtucket, R. I., and he has placed his son, Elmer C. Wightman, in charge as manager. The company has the agency for Premier cars in Pawtucket and at Attlebury, Mass.

Akron, O.—The Cleveland and Toledo branches of the Goodyear Tire and Rubber Co. will in the future come under the jurisdiction of E. F. Jackson, manager of the Detroit district. The Detroit district henceforth will be composed of the following branches: Detroit, Grand Rapids, Toledo and Cleveland. C. W. Holcker has been appointed local manager of the Detroit branch and J. W. Fritzer has been appointed motor truck tire salesman at Toledo. G. F. Dennis will be city salesman at Los Angeles and C. C. Mercer and E. H. Hill junior salesman at the Pittsburgh branch; E. H. Morris salesman at Jacksonville and Grey Sullivan at Chicago.

Atlanta, Ga.—D. T. Bussey and Fred B. Steele are handling the Premier as the Premier Sales Co.

Cambridge, Wis.—George Wahl has established a garage in the Scobie building and will deal in tires and accessories.

Racine, Wis.—The Racine Mfg. Co., manufacturers of motor car bodies and trimming, has plans for two large additions to be built at once.

Buffalo, N. Y.—The Studebaker Corporation has removed its branch office from 1054 Main street to the new Burrell building, Main and Goodrich streets.

Wausau, Wis.—P. V. O. Van Vechten and K. J. Reams have formed a partnership and will erect a garage and repair shop at Third and McIndoe streets.

Dallas, Texas—L. B. Alford, late of San Antonio, Texas, has been appointed assistant business manager of the Studebaker Auto Co for its Dallas office.

Washington, D. C.—The Overland-Washington Motor Co. has opened a service department at 222 Fourteenth street for Overland, Garford and Gramm pleasure cars and trucks.

Cambridge, Mass.—Four motor cars were badly damaged together with the building when the Remington garage at Cambridge caught fire a few nights ago. The total loss to cars and building was about $10,000.

Philadelphia, Pa.—The Henry A. Rowan, Jr., Co. has opened showrooms at 612-614 North Broad street for the distribution of the Cole car in Philadelphia. In addition a service station containing 30,000 square feet of floor space is maintained at 2028 Sansom street.

Burlington, Wis.—The Raymond C. Agner Co., organized some time ago to manufacture several inventions of R. C. Agner, has been fully capitalized at $30,000 and will engage at once in manufacturing the devices, which include the Simplex adjustable spark plug wrench and the Simplex grease and oil gun. The factory will be located in the former high school building. Edward Brook is president; Hugh

Agner, secretary, and George Weiler, secretary, R. C. Agner being general manager.

Donaldsonville, La.—A garage and repair plant is being erected by the Donaldsonville Garage Co.

Revere, Mass.—The Broadway garage, 203-205 Broadway, conducted by F. J. Wiley for some years, has been purchased by Fred E. Eaton.

Philadelphia, Pa.—The new factory branch of the Moon Motor Car Co. at 1927-29 Market street has been placed in charge of E. A. Edwards.

Racine, Wis.—The Western Rubber Sales Co. has been organized at Racine and incorporated under the laws of Wisconsin, with $25,000 capital. T. P. Hardy and B. F. Crandall are the promoters.

Providence, R. I.—The Pilot Automobile Co., with headquarters at 612 Grosvenor building, has the New England territory for the Pilot cars and the company is seeking sub-agents in that section.

Seattle, Wash.—The Mitchell factory branch will be discontinued, the selling of the Mitchell cars for the entire Northwest being placed with the firm of Mitchell, Lewis & Staver. Bruce Brien has been appointed manager.

Brockton, Mass.—The Leighton Auto Co. has made a voluntary assignment for the benefit of its creditors. The liabilities are $34,264.13 and the assets are approximately $6,162.04. William H. Marble has been appointed assignee.

Washington, D. C.—The International Motor Co. has opened a branch at 811 Seventeenth street, N. W., with a service department at Ohio avenue and Fifteenth street, N. W. John S. Larcombe, Jr., formerly with the Motor Sales Co., has been appointed manager. Mack, Sauer and Hewitt trucks will be handled. This is the first truck concern to open a Washington branch.

Syracuse, N. Y.—The Syracuse Auto Supply Co. has opened its new salesrooms in South Warren street.

Syracuse, N. Y.—J. S. Youman, representing the Mitchell car, is now established at his show rooms on West Genesee street.

Indianapolis, Ind.—The Buick Motor Co., of Indianapolis, has appointed R. L. Mellett, formerly of the Premier company, advertising manager.

Grand Rapids, Mich.—G. W. Woodland and C. W. Cowdin have opened a modern garage in the old Christian Reformed church at 50 Commerce avenue, S. E.

Philadelphia, Pa.—V. P. Padula, local manager of the Abbott-Detroit Motor Co., 205 North Broad street, has taken over the Philadelphia agency of the Havers.

Pontiac, Mich.—An agency contract has been closed by the Cartercar Co. with the MacEwen-Webster Auto Co. of Swift Current, Sask., for the provinces of Saskatchewan, Alberta and Manitoba. A branch sales room will be opened by them at Winnipeg as well as at Swift Current.

Philadelphia, Pa.—Preliminary to the establishment of a branch house in this city the Matheson Automobile Co., of Wilkes-Barre, Pa., has secured temporary headquarters at 203 North Broad street. B. M. Westerman, assistant sales manager of the company, has been placed in charge.

Washington, D. C.—W. P. Barnhart & Co., Everitt agents, now located at 1612 Fourteenth street, have taken a 6-years' lease on the building at 1707 Fourteenth street and after extensive improvements have been made, will take possession. The building was formerly occupied by a florist and the large greenhouse will be used for the garage, with a workshop in the extreme rear.

Boston, Mass.—W. S. Sanderman opened a garage at 59 Boylston street, near Harvard square, in Cambridge.

Detroit, Mich.—Evans Maxwell, formerly with the Hudson Motor Car Co., has joined the sales force of the Ignition Starter Co.

Detroit, Mich.—The Bower Roller Bearing Co. is purchasing $50,000 worth of new machinery and equipment to take care of increased business.

Boston, Mass.—The Michigan Motor Car Co. is the name of a new company that has taken the New England agency for the Michigan cars at 357 Boylston street.

Hyannis, Mass.—The concrete foundation for the Cape Cod Auto Co.'s new garage at Hyannis has been finished and the work of constructing the upper story will begin at once.

Boston, Mass.—The motor car department of the Easton Machine Co. is now known as the Morse Motor Co. and it is handling the Paige-Detroit in addition to the Morse at its salesrooms, 66 Hereford street.

Pittsburgh, Pa.—W. Murray Carr, of the Franklin Motor Car Co., has arranged for the erection of a three-story garage and salesroom on North Craig street. The structure will be of steel, reinforced concrete and brick.

Boston, Mass.—Roy A. Faye, formerly New England sales manager for the Matheson, has resigned to become interested in the C. R. G. Mfg. Co., maker of the C. R. G. carbureters, the latter company being recently formed by Mr. Faye. R. G. Nelson, resident manager of the New England Matheson branch, has assumed the duties of sales manager also.

Recent Incorporations

Allentown, Pa.—Lansden Co., capital stock, $1,000,000; to manufacture and deal in motor engines; incorporators, Wm. D. Schantz, W. L. Case, W. J. Maloney.

Atlantic, City, N. J.—Atlantic City Automobile Exposition Co., capital stock, $25,000; to promote motor car exhibitions; incorporators, E. G. Harris, R. L. Babcock, T. B. Williams.

Augusta, Me.—Sewell Cushion Wheel Co., capital stock, $300,000; to manufacture patent wheel for motor cars; incorporators, I. S. Kearney.

Bainbridge, Ga.—Bainbridge Auto and Construction Co., capital stock, $10,000.

Bayside, N. Y.—Bayside Taxicab Co., capital stock, $5,000; incorporators, W. Wagner, C. B. Story, C. Bonner.

Birmingham, Ala.—New Taxicab Co., capital stock, $2,000; F. G. Cheek, president, M. Boshwitz, vice-president, B. Boshwitz, secretary.

Brooklyn, N. Y.—Broadway Penn Garage, Inc., capital stock, $2,000; incorporators, H. Holdstein, M. Kaplan, H. Meisel.

Camden, N. J.—Ceylon Filler Co., capital stock, $3,000; to manufacture motor cars, etc.; incorporators, H. L. Merrick, J. A. Kinney, W. Williams, T. W. Shore.

Camden, N. J.—Bergdoll Car Co. of Missouri, capital stock, $10,000; to manufacture and deal in motor cars; incorporators, F. R. Hansell, J. A. MacPeak, C. U. Martin.

Chicago—Brooks Taxicab Co., capital stock, $2,500; general motor car and taxicab business; incorporators; G. W. Brooks, M. E. Brooks, C. W. McKee, M. D.

Chicago—Standard Auto Equipment Co., car equipment; incorporators, M. Lowenthal capital stock $1,000; to manufacture motor E. B. Friedlander, L. A. Netzel.

Chicago—Bismark Auto Livery Co., capital stock, $10,000; to operate garage; incorporators, M. B. McConigle, J. McCabe and A. George, Jr.

Cody, Wyo.—Cody Garage Co., capital stock, $15,000; to operate garage.

Indianapolis, Ind.—Marion Motor Car Co., capital stock, $1,125,000; president, J. I. Handley.

Long Beach, N. Y.—Driggs Oil Co., capital stock, $1,500; to deal in oils, greases, etc.; incorporators, W. S. Driggs, A. Lodholz, H. J. Frink.

Louisville, Ky.—Citizen's Taxicab Co., capital stock, $10,000; incorporators, C. T. Neale, H. Morris, W. A. Thomas.

Mansfield, O.—Ideal Garage Co., capital stock, $6,000; incorporators, A. J. Summerville.

New York—Brooklyn Delivery Co., capital stock, $2,000; motor car and trucking business; incorporators, M. A. Lynch, C. E. McMahon, E. S. Lucas.

New York—Lippard-Stewart Motor Sales Co., capital stock, $25,000; to deal in motor vehicles; incorporators, T. W. Pelham, T. W. Pelham, Jr., C. E. Dunn.

North Plainfield, N. J.—Farmer's Garage, capital stock, $24,000; general motor car business; incorporators, W. H. Titus, N. H. Cleaves, G. N. Winante, C. C. Wheeler.

Pittsburgh, Pa.—Automobile Supplies Co., capital stock, $50,000; incorporators, W. C. Coffin, E. J. Taylor, J. E. Lauck and others.

Providence, R. I.—Consumers' Rubber Co., capital stock, $600,000; to manufacture and deal in rubber goods; incorporators, P. W. Gardner, A. L. Churchill, E. B. Moulton.

Rochester, N. Y.—Union Electric Car Co., capital stock, $5,000; to manufacture motor vehicles; incorporators, A. McNall, H. J. Schneider, H. E. Pramer.

Salt Lake City, Utah—Lark Automobile Stage Co., capital stock, $3,200; to operate stage line; incorporators, A. Frank, L. J. Gilmer.

Sioux City, Ia.—Mandel-Frisch Auto Repair Co., capital stock, $5,000; incorporators, A. J. Mandel, A. Frisch.

St. Louis, Mo.—Lindell Auto Sales Agency and Repair Co., capital stock, $3,000; incorporators, A. F. Groebl, T. Sepeier, C. F. Beck.

St. Joseph, Mo.—Armstrong Auto Co., capital stock $2,000; to deal in motor cars; incorporators, J. M. Armstrong, L. M. Armstrong, A. B. Reichman.

Troy, N. Y.—Vanderheyden Garage Co., capital stock, $5,000; incorporators, W. G. Pike, E. M. Pike, F. E. File.

Waterbury, Conn.—Elton Garage, Inc., capital stock, $1,000.

Westwood, N. J.—Westwood Auto Garage Co., to deal in motor cars; capital stock, $10,000; incorporators, W. Beverally, A. H. Steel, W. Halliday.

Wilmington, Del.—P'A Mon Metallic Oilless Bearing Co., capital stock, $50,000; incorporators, E. E. McWhiney, W. H. Maloney.

Wilmington, Del.—John G. Funk Combination Steel and Pneumatic Tire Co., capital, $200,000.

Wilmington, Del.—Morrow Gasoline Vender Co., capital stock, $100,000; to manufacture and deal in machinery.

Yonkers, N. Y.—Yonkers Auto Repair Co., capital stock, $1,000; incorporators, H. Flader' A. Kipfer, E. Kipfer.

The Motor Car Repair Shop

Hints to the Amateur

Practical Pointers for Motorists on the Fundamental Principles of Motor Car Maintenance

AT this time of the year, many recruits are being inlisted into the ranks of the army of motorists; many cars are changing hands; and consequently there is considerable activity among motorists in the way of tinkering about the car and putting it in shape for strenuous service. A few general hints and precautions, therefore, may be appreciated.

First of all, above all things, don't figure on climbing into a new car for the first time and driving off for a day or an afternoon without giving it more attention than just filling the oil and gasoline reservoirs, and the radiator with water. Don't think that because the car is brand new and just from the factory, or because it has just been thoroughly overhauled, that it is, without a doubt, in first class condition and ready for regular service. It may be; it should be; but often, very often, it is not.

Rather contemplate spending several hours oiling, inspecting and equipping the new, or just-overhauled car. Do this a day or so before the first few trips are taken. If for instance, you contemplated using the car for the first time on a Sunday, start to get the car into shape on Thursday or Friday. You may find everything in excellent shape, and be through in an hour; and again it may be found that there are several things that require attention. If you put the job off until Sunday morning, it is very possible you will have to put in a few hours of very hard work to prepare the car for the afternoon outing; in fact it often happens that work which you estimate can be done in a few hours will keep you very busy until the afternoon is half over; the result will be a disappointed family. "Take time by the forelock," as the saying goes, and have the car ready on Sunday morning if you intend to use it in the afternoon, and on Saturday evening if to be used on Sunday morning. This policy will convert the work into a pleasant and instructive pastime, and add much to the pleasure of motoring. This advice, of course, pertains to the first few trips, after which the habit of caring for the car will have been formed, and but little regular attention necessary thereafter.

Putting Car in Shape

To put a car into shape, begin by removing the front seat cushion over the opening to the gasoline tank; also take the cushion off of the rear seat and place both out of the way. Next remove the hood over the motor, and the floor boards in front and behind the front seat. The object is to clear the decks for action so to speak and render every part of the car as accessible as possible. Don't tackle the job while arrayed in a suit that you would not have soiled; and don't try to protect a good suit by wearing a suit of overalls over them; oil is very penetrating, and besides you are apt to be too warmly clad to work comfortably.

Start With Motor

Perhaps it is best to start with the motor: Remove the radiator cap and place it somewhere on the car, as near to the filler opening as possible and in a place from which it will not be apt to fall when the motor is started. Make an effort to find a good place for it and always put it in this place. Get the habit; and you will save yourself much annoyance in the way of crawling under the car, reaching under the motor into the dirty dust pan, or rummaging about the garage looking for it. Fill the radiator with water but do not replace the cap, until the motor has been run for a few minutes, when a little more water may be required.

Next fill the oil reservoir of the motor with the required amount of lubricating oil. For the proper grade and amount of oil, consult the instruction book that comes with the car; or the previous owner or user. This is important: Too much oil in the motor causes it to smoke, fouls the spark plugs, causes misfiring, hastens the formation of carbon deposits that prevent the valves from seating tightly, and gives rise to many varieties of trouble. After properly filling the oil reservoir of the motor, take up a hand oil can, and carefully put a few drops of oil into all the oil holes you can find about the motor. You will find some of these on the fan shaft, on the pump and magneto shafts perhaps, on the magneto itself, and on the pivot pins of the rocker-arms that operate overhead valves.

Oil Outside Parts

Also wipe the dust and dirt away from the valve lifters, and then apply a drop of oil around each one; but do not oil the valve stems. To complete the oiling, turn down all grease cups on and around the motor, including those that supply grease to the clutch-spindle or shaft. These latter generally are to be found on a cone or band clutch, and are usually rather inaccessible. But get at them; release the compression of the motor cylinders by opening the priming cocks, or by removing the spark plugs; then the flywheel can be readily turned by hand until the cups can be most easily reached.

Now fill the gasoline tank. Adopt the practice of straining the gasoline through a chamois skin; and avoid much trouble due to water and dirt in the fuel. Water or dirt in the gasoline gives carbureter trouble, accompanied by misfiring for which the magneto or ignition system often is suspected. It is advisable to take every precaution against misfiring; for to drive a car whose motor cylinders are not working regularly, is like driving a lame horse—just as bad for the car as the horse, and just as discomforting to the occupants of the vehicle propelled thereby.

If the supply tank is situated below the carbureter of the motor, and pressure is used to force the fuel therefrom, see that the cap is tightly replaced after filling the tank; and pump the required amount of air into the tank. If the tank is above the carbureter and flows to it by gravity, see that the air hole in the cap is not stopped with dirt; and do not cover it with waste, or cloth, or anything that will prevent it from admitting air to the reservoir.

Having filled the tank, see if the fuel has flowed into the carbureter by holding down the priming pin, or by lifting or depressing the float stem, as the case may be; this should be done until gasoline is seen to drip or overflow from the carbureter. The motor itself then is ready to be started.

Put Levers in Neutral

Before attempting to start the motor, however, see that the gear-shifting lever is in the neutral position. Turn on the ignition switch. Retard the spark control lever. Advance the throttle a little if necessary. Then try to crank the motor with the left hand, and by pulling upward only. Learn to crank with the left hand from the beginning; get the habit, and you soon will do it as easily, as with the right hand and with far more safety should you at some time forget to retard the spark control lever.

When the motor is started, advance the spark control lever, and retard the throttle lever, until the motor runs as slowly and evenly as possible, then fill up the radiator if necessary and replace the cap. When satisfied that the motor is running properly, stop it; again take up the hand oil can, and oil every moving connection you can find on the car; including the universal joint between the clutch and gearset and those behind the transmission gearset; oil the brake, clutch and gear-shifting control-rod connections, the spring shackles, the steering connections, and anything else that you can find that should require oil.

Get the car into as light a place as possible during this hand-oiling operation, and be ever on the look-out for loose nuts, etc.